



# Inflation Report

1/2004



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# ■ Foreword

The Riksbank's monetary policy is targeted at keeping inflation at 2 per cent, with a tolerance for deviations up to  $\pm 1$  percentage point. The Riksbank uses several different methods to communicate monetary policy considerations and opinions. The Inflation Report presents the Riksbank's overall appraisal of inflation prospects over the coming years. Press releases are used to report the Executive Board's considerations and decisions. Executive Board members may differ in their opinions of future inflation. The separate minutes of the Executive Board meeting describe the general assessments and the individual members' opinions on various proposals, as well as the decision taken.

This Inflation Report reproduces the main features of the presentations and discussions of inflation at the Executive Board meetings on 17 and 23 March 2004. The Report constitutes the background to the Bank's monetary policy decision on 31 March 2004. Any divergent opinions of inflation prospects are recorded in the separate minutes of the Board meeting on 31 March, to be published on 20 April 2004.

According to Chapter 6, Article 4 of the Sveriges Riksbank Act (1988:1385), the Riksbank is obliged to provide a written report on monetary policy to the Riksdag Committee on Finance at least twice a year. The Riksbank has chosen to use two of the year's four Inflation Reports for this purpose. This report constitutes one such account to the Riksdag.

This Report presents the Riksbank's appraisal of inflation prospects up to the end of Q1, 2006. In order to clarify the consequences for monetary policy, the analysis starts from the technical assumption of an unchanged repo rate during this period.

The report begins with a summary. This is followed by a discussion of the most probable development of inflation's principal determinants. Finally, there is a presentation of the Riksbank's overall assessment of inflation prospects in the main scenario and the most important risks in the assessment. The report also contains a number of boxed texts, the purpose of which is to provide additional knowledge about matters of importance for inflation assessments and the formation of monetary policy. One of these boxed texts contains a report assessing monetary policy during the period 2001-2003.

Stockholm, March 2004

Lars Heikensten

Governor of Sveriges Riksbank



## ■ Summary

*There are increasingly clear signs that the Swedish economy is about to recover, after an unusually mild economic downturn. Inflation and growth in 2003 were as the Riksbank had expected. Given the present economic situation, the inflation rate is low. This is largely due to energy prices falling back after the substantial increases at the beginning of 2003, a development in line with the Riksbank's forecasts over the past year. However, the most recent data shows that inflation has been even lower than expected, with CPI inflation at -0.3 per cent and UND1X at 0.1 per cent in February. This is mainly due to unexpectedly low import prices, although a surprisingly weak growth in domestic costs has also contributed. These factors are expected to affect developments over the next few years and to contribute to downward revisions of inflation forecasts. Despite the fact that the recovery is in progress and growth in the Swedish economy is forecast to be around 2½ per cent over the coming two years, inflation is expected to be below the target level of two per cent.*

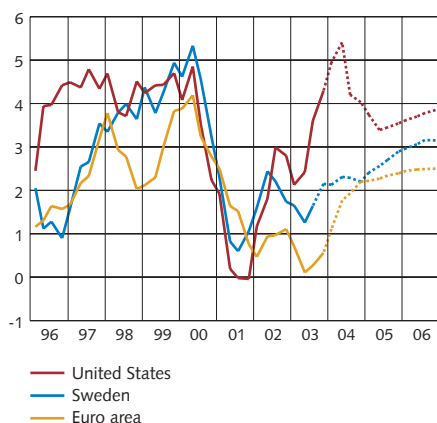
### ■ ■ Recovery continues.

International economic activity has continued to improve in recent months and global trade has increased. Both firms and households show more optimism in confidence surveys and share prices around the world have risen. Together with an expansionary economic policy, this indicates a continued recovery over the coming years.

However, there is a clear difference between developments in different regions. In the euro area, growth appears to have become slightly weaker at the end of last year than was assumed earlier. This may be at least partly due to the euro appreciating. The assessment is that the strong exchange rate will hamper the upturn slightly more than anticipated both this year and next. Most indications are that growth in the United States, Asia, eastern and central Europe and Latin America may be slightly stronger than expected. All in all, the Riksbank's assessment is that GDP growth in the OECD area will be 3.2 per cent this year, 2.8 per cent in 2005 and 2.9 per cent in 2006, which is a small upward revision to the figures in the December Inflation Report. Swedish export market growth is expected to rise gradually during the forecast period and amount to approximately 7 per cent in 2006, which is in line with its historical average.

The economic downturn has been unusually mild in Sweden. Expansionary fiscal policy, combined with low interest rates, has maintained consumption at a good level while exports have benefited from a relatively weak exchange rate. During the autumn and winter the recovery has progressed largely as expected. The view of developments in aggregate demand over the coming years has not changed appreciably. One of the driving forces behind the upturn so far has been international economic activity and thereby rising exports, while consumption has increased at a stable rate. During the second half of 2003, exports actually increased slightly more rapidly than assumed in the December Inflation Report, and there is also reason to be somewhat more optimistic with regard to future developments. However, as imports are also expected to increase, foreign trade is unlikely to make any substantial positive contri-

**Figure 1. GDP for Sweden, United States and euro area, outcome and forecasts. Percentage 12-month change**



Note. Broken line represents the Riksbank's forecast.

Sources: US Department of Commerce, Eurostat, Statistics Sweden and the Riksbank.

tribution to GDP growth. Instead, the upturn is expected to be fuelled by an increase in investments, which will be partly stimulated by the increase in exports and partly by low interest rates. However, investments showed a slightly weaker development than expected during the latter part of 2003, which means that the expected recovery is postponed somewhat. On the other hand, stronger growth in real disposable incomes in future and lower interest rates than was previously anticipated provide reason to be slightly more optimistic with regard to growth in consumption. Local government sector consumption is expected to show slower growth, however. This is mainly connected with the financial situation in local governments. During 2006 public sector consumption is expected to pick up, as the public sector finances improve.

One special factor that affects production, the number of hours worked and firms' costs is that 2004 contains four working days more than 2003. New calculations by the National Institute of Economic Research imply that the calendar effects are greater than was assumed in the December Inflation Report. The number of hours worked and GDP growth are now expected to increase more this year as a result of the calendar effect. However, this does not affect the view of resource utilisation, as it is assumed that potential production is influenced in the same way by the calendar effect. All in all, GDP growth is expected to increase by just over 2½ per cent a year (see Figure 1). At the end of the forecast period, the economy will approach full resource utilisation.

### ■ ■ Weaker price and cost pressure.

Despite the fact that the economic upturn is progressing roughly as expected, inflationary pressure is assessed to be low. This is due to both low international inflation and to the weak growth in domestic costs.

Producer prices on manufactured goods in our most important import countries are rising only slightly. The fact that international price pressure is currently low is partly a cyclical phenomenon. However, global inflation has shown a falling trend over a long period of time. One reason for this may be that monetary policy in many countries has been more clearly aimed at maintaining a low inflation rate over the past decade. Increased trade and tougher competition may also have contributed to a sustained decline in the inflation rate, as may the increased significance in world trade of low-income countries like China. On the other hand, there has been a relatively large increase in oil prices and prices on other commodities recently.

Rising global resource utilisation indicates that world market prices for manufactured goods will increase at a more rapid rate in future, although the upturn is expected to be slightly weaker than indicated by historical patterns.

Domestic cost pressure is also low at present, which is partly due to an unexpectedly strong growth in productivity last year. It is not possible to determine the exact causes of this and it is therefore difficult to assess future developments. The stronger productivity growth is probably due to both cyclical and more sustainable factors. Productivity will probably decline in the near future, for cyclical reasons. However, there is also reason



to assume a slightly more sustainable element in the upturn in productivity. Given this, productivity growth is expected to be slightly stronger than was assumed in the December Inflation Report (see boxed article "How persistent is the recent rise in productivity?").

Around the turn of the year, the Swedish labour market developed more weakly than was forecast in December, and most indications are that there is reason to be slightly more pessimistic with regard to employment during the forecast period. Wage increases may therefore be slightly more subdued this year and next year compared with the assessment in the previous Inflation Report. Firms' unit labour costs are calculated to have increased by around 1 per cent last year. This year they are expected to rise by only 0.2 per cent, in 2005 by around 1.3 per cent and in 2006 by 2.1 per cent. The lower unit labour costs are also linked to the larger number of working days in 2004. All in all, this indicates that domestic cost pressure will increase over the coming years, but that it will probably still be moderate at the end of the forecast period.

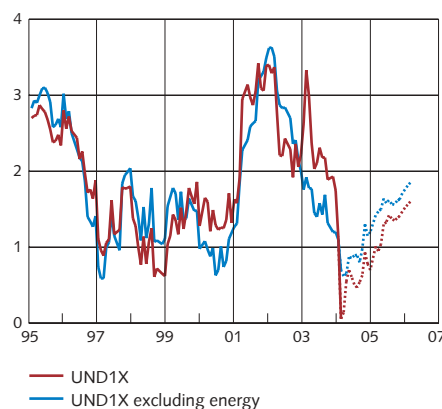
Inflation fell substantially last year and at the beginning of this year. This is essentially an expected decline, as a result of the substantial energy price rises at the beginning of last year (see Figure 2).<sup>1</sup> Energy prices have been adjusted downwards largely as expected. This is good for inflation in general, as the risk of contagion effects in other parts of the economy is reduced. These risks have also declined as rental agreements have so far been signed at reasonable levels. In addition, the very recent outcome of inflation has been lower than expected, largely due to developments in import prices, but also as a result of weak developments in domestic costs (see the boxed article "Recent developments in inflation"). The recent low inflation has also led to inflation expectations being subdued somewhat.

## Assessment of inflation

Inflation on average is expected to be significantly below the Riksbank's inflation target over the next two years. However, it is expected to increase gradually as resource utilisation rises, both in Sweden and internationally. The upturn in inflation is expected to be slower than previously anticipated, as domestic cost pressure is expected to be weaker (see Figure 3 and Table 1), while imported inflation (excluding oil prices) is expected to be much lower. For 2004 and 2005 the forecast is that UND1X inflation will amount to an average of 0.6 per cent and 1.2 per cent respectively, which is 0.5 and 0.4 percentage points lower than the assessment in the previous inflation report (see Table 1). An important circumstance is that, as from mid-2005, CPI and UND1X inflation are no longer expected to be influenced by the large fluctuations in electricity prices that took place last winter.

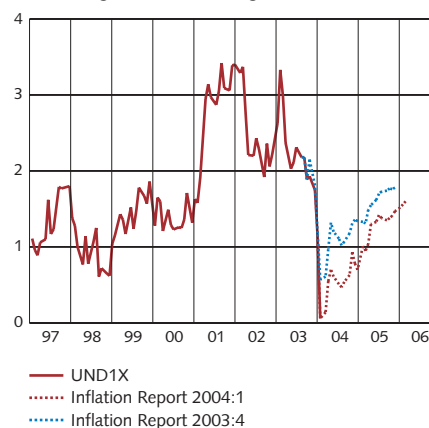
The balance of risks is also relevant to the shaping of monetary policy. The Riksbank's assessment is that the risks of international and

**Figure 2. UND1X including and excluding energy. Percentage 12-month change**



Note. Broken line represents the Riksbank's forecast.  
Sources: Statistics Sweden and the Riksbank.

**Figure 3. UND1X, comparison of forecasts. Percentage 12-month change**



Note. Broken line represents the Riksbank's forecast.  
Sources: Statistics Sweden and the Riksbank.

<sup>1</sup> The fact that inflation rates have been low and falling in many countries in recent years does not imply a problem of general deflation, although the average price changes have been negative on occasion. The problem of deflation has been discussed in detail in a boxed article in Inflation Report 2003:3.

domestic economic activity being poorer than anticipated have diminished and that the probability of better activity has increased. It is true that there are still some question marks regarding developments in the labour market, in Sweden and the rest of Europe as well as the United States. Another possible source of concern is the large deficits in the budget and current account in the United States. Nevertheless, the picture of an economic upturn has become increasingly clear, and at present the greatest risk appears to lie in underestimating the strength of the upturn and its consequences for inflation. The recent sharp rise in commodity prices is an indication of this. If monetary policy is left unchanged, inflation will sooner or later exceed the Riksbank's inflation target. There is a possibility this could even occur during the forecast period. For one thing the economic upturn could prove stronger than expected, and for another thing economic activity could lead to more rapid price increases – particularly for oil and other commodities – than forecast in the main scenario assessments.

In the main scenario, domestic cost pressure has diminished. However, there is considerable uncertainty regarding this. The three-year central wage agreements signed in the industrial and retail sectors (at levels in line with the Riksbank's forecasts) have reduced the uncertainty regarding wage trends. However, there is still a risk that wage formation at local level could lead to higher wage increases and inflation than expected. On the other hand, one factor that could lead to lower-than-expected inflation, even if production and demand develop as forecast, is productivity growth. It is difficult to determine how sustainable the recent productivity increase will be. Strong growth in productivity and low price increases (even price falls in some sectors) have been observed in other countries as well as Sweden. It is possible that this phenomenon is due to structural changes, such as the effects of earlier investments in information technology and increased trade and competition, which have more long-term effects on productivity and more subduing effects on inflation than assumed in the main scenario. However, productivity could also be lower than anticipated in the main scenario. The Riksbank's assessment is that the risks related to domestic cost pressure are balanced.

All in all, this means that the risk-adjusted assessment of inflation will be slightly higher than in the main scenario – although still lower than the Riksbank's inflation target – as a result of the risk of higher inflation stemming from international and domestic economic activity.

**Table 1. Inflation forecast in the main scenario.  
Percentage 12-month change**

	12-month average			12-month figures		
	2003	2004	2005	mar 04	mar 05	mar 06
CPI	2.1 (2.1)	0.4 (1.1)	1.5 (1.9)	-0.3 (0.4)	1.2 (1.6)	1.9
UND1X	2.3 (2.3)	0.6 (1.1)	1.2 (1.6)	0.1 (0.6)	0.9 (1.3)	1.6
UNDINHX	3.6 (3.6)	1.7 (2.2)	1.9 (2.3)	1.5 (1.9)	1.6 (2.0)	2.2
UNDIMPX	-0.2 (-0.1)	-1.6 (-1.1)	0.0 (0.3)	-2.7 (-2.1)	-0.3 (0.0)	0.4
UND1X excluding energy	1.5 (1.6)	0.9 (1.6)	1.5 (1.9)	0.6 (1.3)	1.5 (1.9)	1.9

Note. The figures in parentheses are the assessments in the December Inflation Report. UND1X is CPI inflation excluding household mortgage interest expenditure and the effects of changes in indirect taxes and subsidies. UNDINHX refers only to prices of mainly domestically-produced goods and services in UND1X. UNDIMPX refers to prices of mainly imported goods and services in UND1X.

Sources: Statistics Sweden and the Riksbank.

# ■ Determinants of inflation

## The financial markets

Interest rates have fallen in the global bond markets since the December Inflation Report. One important reason for this is that the expected tightening of monetary policy will be delayed somewhat. In Sweden the repo rate was cut by 0.25 percentage points to 2.50 per cent in February. The TCW exchange rate of the krona has been slightly weaker than was forecast in December, but the forecast is only being marginally revised. The dollar has continued to weaken against the euro, despite the high growth rate in the US economy. All in all, developments in interest rates and exchange rates are expected to have a less restraining effect on growth in the Swedish real economy during the forecast period than was anticipated in the December Report

### ■ Falling long-term rates.

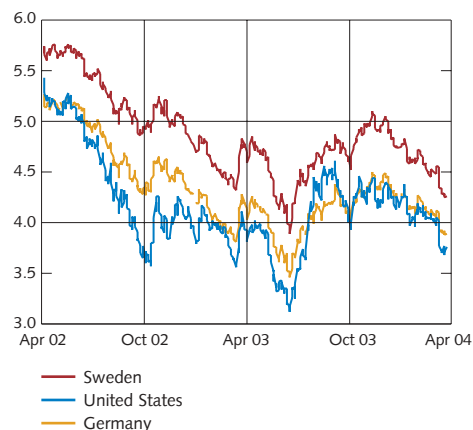
Since the previous inflation report, interest rates have fallen on global bond markets, while equity prices have continued to rise (see Figure 4).

An important reason why long-term rates around the world fell is probably the expectations of low inflation and thereby of less restrictive monetary policy. The US Federal Reserve (FED) has repeatedly said that it may retain its low interest rate for some time. This is because resource utilisation in the wake of high productivity growth appears to have been lower than expected. Pricing on the money markets and forward contracts in both the United States and the euro area indicate that there are now expectations that monetary policy will not be tightened until later (see Figure 5).

Swedish long-term interest rates have fallen more than those in Germany. The spread has declined by almost 0.20 percentage points to around 0.40 percentage points since the December Report. Following the publication of the previous Inflation Report and the repo rate being left unchanged, expectations of a rate cut were strengthened. Yields on 3-month treasury bills began to fall a few days later.<sup>2</sup> On 5 February, the Riksbank decided to cut the repo rate by 0.25 percentage points to 2.50 per cent. Pricing on the money market reflects expectations of an even lower repo rate during the spring. The Riksbank is not expected to raise the repo rate until the beginning of next year (see Figure 6).<sup>3</sup>

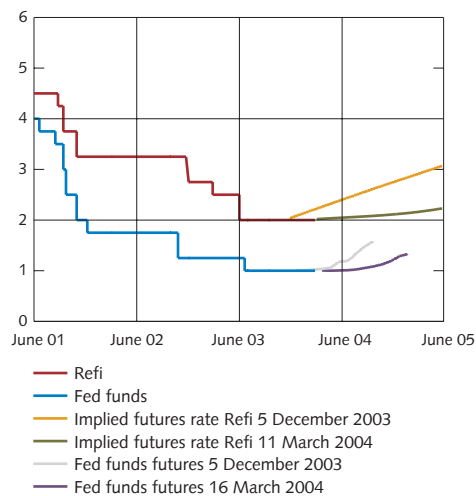
As forecast earlier, Swedish long-term interest rates are expected to continue to rise during the forecast period as economic activity increases. However, the Riksbank has revised down its interest rate forecast compared with the assessment made in December. This is due to a fall in interest rates around the world and to expectations of continuing, relatively expansionary monetary policy in the United

Figure 4. Yields on 10-year government bonds in Sweden, Germany and the United States. Per cent



Source: The Riksbank.

Figure 5. Monetary policy expectations in the euro area and the USA according to implicit forward rates and Fed Funds futures. Per cent



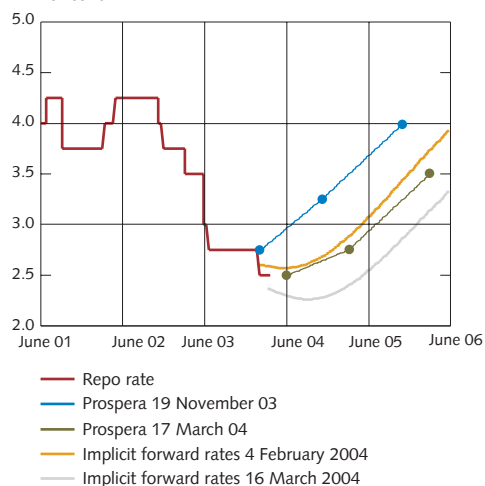
Note. Fed funds is the US central bank's key interest rate and Refi is the European Central Bank's key rate. Fed funds futures are forward contracts regarding the US key rate.

Source: The Riksbank.

<sup>2</sup> Publication of the minutes of the monetary policy meeting, on 18 December, does not seem to have had any significant effect on short-term rates.

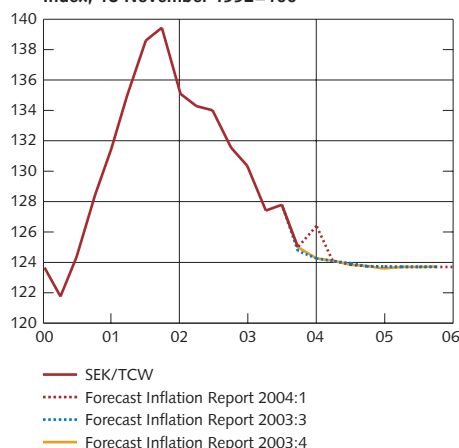
<sup>3</sup> However, implicit forward rates indicate that market expectations of future short-term rates have been adjusted downwards several years ahead, which appears difficult to motivate solely on the basis of new information regarding prospects for economic activity and inflation.

**Figure 6. Repo rate and monetary policy expectations in Sweden (according to implicit forward rates and survey data).**  
Per cent



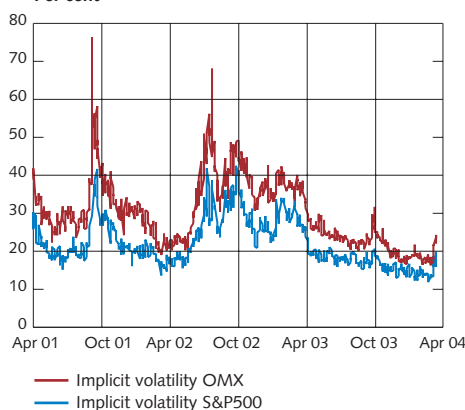
Sources: Prospera and the Riksbank.

**Figure 7. Trade-weighted exchange rate forecast, SEK/TCW.**  
Index, 18 November 1992=100



Source: The Riksbank.

**Figure 8. Implicit volatility on the equity market.**  
Per cent



Source: Bloomberg.

States and the euro area during the forecast period. The yield on the 10-year Swedish bond is expected to increase to an average of 4.90 per cent during 2004, to 5.35 per cent next year and 5.60 per cent in 2006. This means that the long-term rate is expected to be 0.2-0.4 percentage points lower than the forecast in the December report.

#### ■ Marginal revision in exchange rate forecast.

Despite the relatively rapid growth in the US economy, the dollar is weaker against the euro than it was in December 2003. This is probably linked to the financial markets' continued focus on the deficits in the US budget and current account.

Forecasts for the krona exchange rate, measured in terms of the Riksbank's trade-weighted currency basket, the TCW index, have remained largely unchanged between the recent Inflation Reports. The forecasts have been well in line with the actual outcome. However, the exchange rate has been slightly weaker than was forecast in December, which is mainly due to the krona weakening against the euro. One partial explanation for this could be the expected relative interest rates, where there has been some shift since the autumn. The weakening could also be due to capital outflow from the pension system and unease regarding the dollar/euro exchange rate, which tends to weaken the currencies of small economies outside of the euro area.

Compared with the assessment in December, only a marginal adjustment is made in the forecast for the krona in terms of the TCW index. The krona is expected to strengthen to an average of 124.5 in 2004, and 123.7 in 2005 and 2006 (see Figure 7). As before, this is based on Sweden's good growth prospects, relatively good public finances in an international comparison, and a continued surplus on the current account.

#### ■ Strong stock market development indicates good economic prospects.

Share prices around the world have continued to rise since the December Inflation Report. This upturn is mainly due to increasing optimism with regard to economic activity. Risk premiums in the stock market have essentially remained at relatively low levels, although there has been a slight upturn recently (see Figure 8).

#### ■ Real interest rates and real exchange rate expected to subdue demand.

The downturn in short and long-term real interest rates entails some stimulation of demand and in this sense a slightly more expansionary effect on growth in the real economy than was anticipated in the December Inflation Report, while the real, trade-weighted krona exchange rate has weakened slightly (see Figure 9).

The Riksbank's assessment is that rising interest rates and an appreciation of the krona exchange rate during the forecast period will have a restraining effect on demand. However, this effect is expected

to be slightly less than the assessment in the previous Inflation Report, as the repo rate has been cut by 0.25 percentage points and forecasts for long-term interest rates have been revised downwards. The effect on demand in the economy of rising interest rates and a stronger krona will to some extent be counteracted by stable developments in equity and house prices. However, the rate of increase in house prices is expected to abate when interest rates rise.

### ■ Household borrowing continues to rise while corporate borrowing declines.

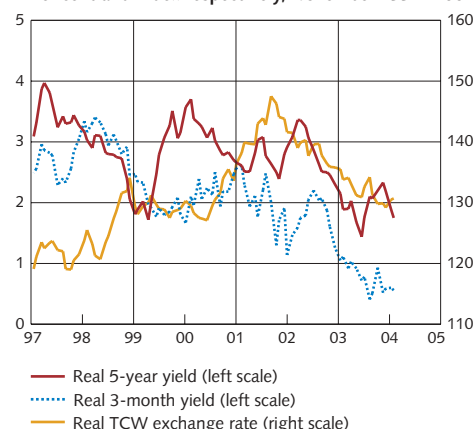
The annual growth rate of M3 has fallen rapidly in recent months, from 6.0 per cent in October last year to 2.2 per cent in January.<sup>4</sup> Households' bank deposits have increased at a slower rate recently, which is probably due to increased interest in investing in equity.

The increase in households' total borrowing in January this year was just over 10 per cent on an annual rate. It is mainly borrowing from mortgage institutions that has increased, which indicates that the loans are largely connected with the purchase or renovation of houses (see Figure 10). Firms' borrowing fell by just over 3 per cent during the same period, which is probably connected with the postponement of investments.

#### Revised forecasts since the December inflation report.

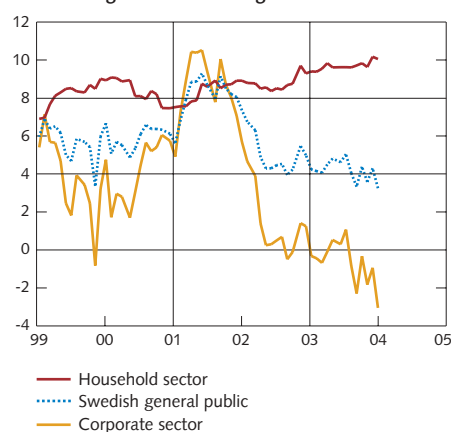
- Long-term interest rates revised down as a result of expectations of lower inflation and a less restrictive monetary policy in, for instance, the United States and euro area. Long-term interest rates in Sweden expected to be 0.2-0.4 percentage points lower than forecast in the December Report.
- In line with the December Report, the krona is expected to strengthen in terms of the trade-weighted index.
- Future developments in interest rates and exchange rates are expected to have a slightly less restraining effect on growth in the real economy during the forecast period than was anticipated in the December Report.

Figure 9. Real interest rate with five-year and 3-month duration respectively and real TCW-weighted exchange rate. Per cent and index respectively, November 1992=100.



Sources: The National Institute of Economic Research, Prospera and the Riksbank.

Figure 10. All credit institutions' lending to the general public in Sweden, sector breakdown. Percentage 12-month change

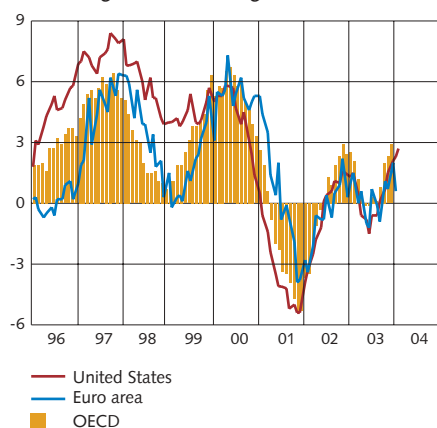


Source: Statistics Sweden.

4 The broad money aggregate M3 consists of the general public's holdings of banknotes and coins, deposits in banks and holdings of bank certificates issued in Swedish kronor.

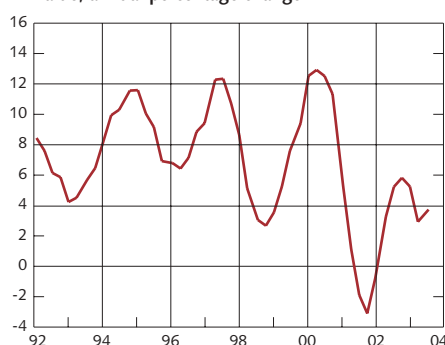


**Figure 11. United States, OECD and euro area: manufacturing output. Percentage 12-month change**



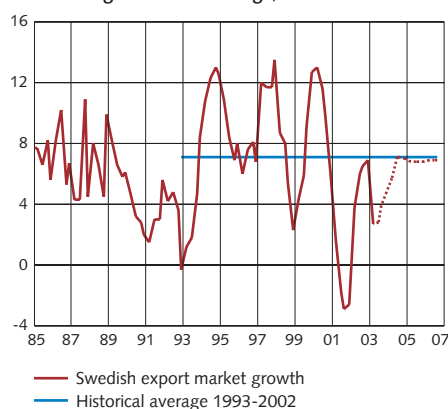
Sources: The OECD, Eurostat and the Federal Reserve.

**Figure 12. Global trade, goods and services. Value, annual percentage change**



Source: The OECD.

**Figure 13. Swedish exports: market growth. Percentage 12-month change, volume**



Note. The outcome series is a weighted average of the real goods imports for the countries that constitute the Swedish export market. The series is to some extent an approximation, as the statistics for some smaller countries/regions lag behind. Forecasts from the NIESR are used as far as possible to estimate goods imports for the countries/regions where outcome is published after a time lag. Outcome is missing for 3 per cent of the countries/regions.

Sources: NIESR and the Riksbank.

## International economic activity and inflation

*During the winter the international economic upturn has strengthened and become more broad-based, in accordance with the forecast in the December Inflation Report. This year the growth rate in the OECD area is expected to amount to 3.2 per cent and later to fall back slightly during 2005 and 2006, when economic policy becomes less expansionary. Swedish export market growth is expected to rise gradually during the forecast period, in line with the forecast in the December Inflation Report. There are still plenty of unutilised resources in the global economy, and global price pressure is expected to be moderate.*

### ■ Recovery continuing as expected.

Since the previous Inflation Report, the upturn in manufacturing activity and world trade has continued (see Figure 11). The recovery has been particularly strong in the United States and Asia, where both exports and domestic demand have contributed to the positive developments. Recently, the Japanese economy has also grown at a more rapid rate than many analysts had expected. In the euro area, the most recent statistics indicate that the recovery has gained a foothold in the industrial sector, while domestic demand continues to be relatively weak.

This year, growth in the OECD area is expected to be relatively strong. One of the driving forces behind the upturn is the expansionary economic policy in the United States. In 2005 and 2006, growth in the OECD area is expected to fall slightly. Compared with the December Inflation Report, growth is expected to be somewhat stronger, which is connected with a slightly more optimistic view of the US economy. However, growth in the euro area is assessed as somewhat weaker this year and next year as a result of the strong euro.

World trade declined in 2001, but since then there has been a recovery (see Figure 12). This year, trade is expected to increase even more as a result of stronger manufacturing activity, increased investment, some stockbuilding and a recovery in the ICT sector. Swedish export market growth is expected to increase gradually during the forecast period. In 2006, growth is expected to amount to around 7 per cent, which is roughly in line with the average growth rate since 1993 (see Figure 13). The increase is mainly due to the expectation that trade with EU countries, which comprise most of Sweden's trading partners, will be more extensive as growth in these countries pick up and demand increases. The assessment of Swedish export market growth is largely the same as in the previous Inflation Report (see Table 2). Slightly weaker growth in the euro area will thereby be counterbalanced by stronger growth in other countries to which Sweden exports.

Oil prices have continued to rise more than expected since the December Inflation Report, partly as a result of the low stocks levels in the United States. The strong increase has caused many analysts to make upward revisions in their forecasts for oil prices, which are reflected in rising forward rates. In addition, OPEC has recently decided to reduce its production quotas. The higher growth rate in the global economy has also

contributed to the Riksbank making an upward revision to its forecasts for oil prices. However, they are still expected to fall in the near future (see Figure 14). The difficulties in forecasting oil prices were discussed in the boxed article "Oil prices" in the October 2003 Inflation Report.

Prices for other commodities have also risen considerably in recent months. The broad upturn coincides with manufacturing activity in the OECD area improving (see Figure 15) and also reflects the strength of the global demand. It is probable that the large industrial expansion in China has contributed to an increase in the global market price for steel of just over 30 per cent between November 2003 and January 2004. Today, China consumes half of all of the world's cement, 30 per cent of all coal and 36 per cent of all steel. In addition, the country is now the world's second largest importer of crude oil (after the United States). Over the past year, China's import of oil has increased by 77 per cent. However, pricing in the forward market indicates that commodity prices will fall from their present high levels during the forecast period.

#### ■ Expectation of low international price pressure.

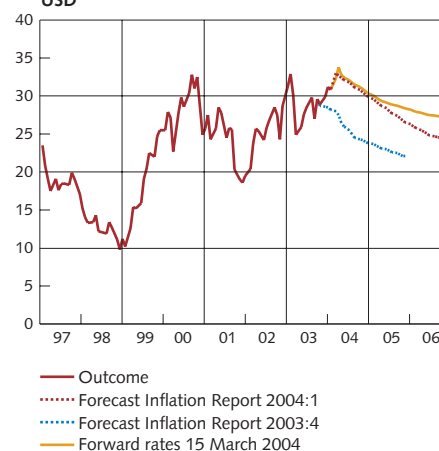
Price pressure on manufactured goods has been low in recent years (see Figure 16). This is probably largely connected with the earlier weak economic activity (see Figure 17). Another explanation may be structural changes in the world economy as a result of trade and production patterns becoming globalised. This is expressed in rapid growth in typically low-income countries such as China, although new applications of information technology and deregulation may also have contributed. These changes lead to increased competition, which in turn leads to lower price increases. Moreover, many countries have chosen to focus their monetary policy on maintaining low inflation. Figure 16 shows that the rate of increase in average international producer prices for manufactured goods fell during the 1990s.

At present there are plenty of unutilised resources in the global economy. However, the assessment is that these will gradually be put into use during the forecast period as demand increases. This, together with high commodity prices, indicates that the rate of price increase on manufactured goods will increase. It is nevertheless estimated that the rise will not be very great due to the structural changes. All in all, this means that international price pressure is estimated to be slightly lower over the coming years than was assumed in December.

#### ■ Continued strong economic activity in USA.

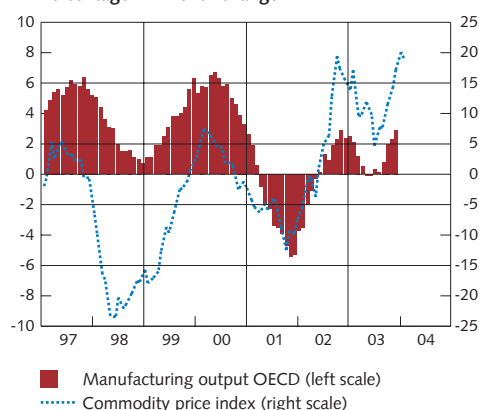
In the United States, growth has continued to be surprisingly positive since the December Inflation Report. During Q4, 2003 GDP growth was 4.1 per cent at a calculated annual rate, which was slightly more than expected. Several factors indicate that growth will accelerate further over the next six months. The financial conditions, in the form of low interest rates, a weaker dollar and rising equity prices, will stimulate demand. In addition, the expansionary fiscal policy is expected to lead to a continued increase in disposable incomes. Low inflation and a gradual recovery in the labour market will also provide a contribution. Increasingly strong

**Figure 14. Oil prices, outcome, forecasts and forward rates.**  
USD



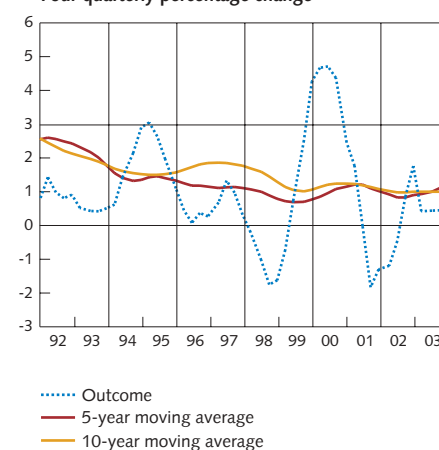
Sources: The International Petroleum Exchange and the Riksbank.

**Figure 15. Manufacturing output in the OECD area and commodity price index.**  
Percentage 12-month change



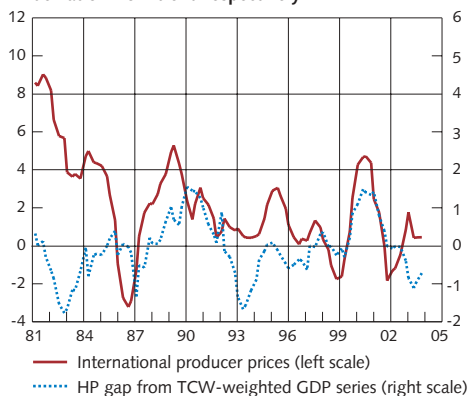
Sources: The OECD and The Economist.

**Figure 16. International producer prices: manufactured products.**  
Four quarterly percentage change



Sources: The OECD and the Riksbank.

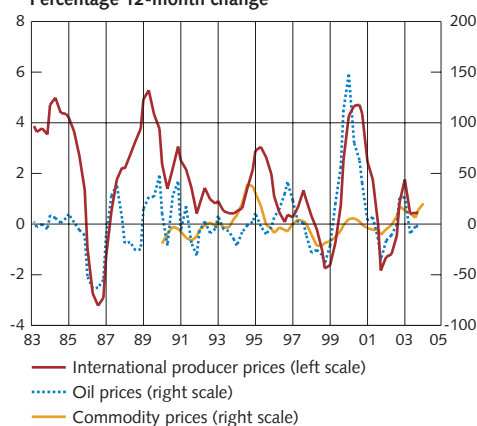
**Figure 17. International producer prices for manufactured goods and total GDP gap.**  
Percentage 12-month change and percentage deviation from trend respectively



Note. The TCW-weighted HP gap includes 15 of the 20 countries in the TCW. Together they comprise 95 per cent of the total TCW.

Sources: The OECD and the Riksbank.

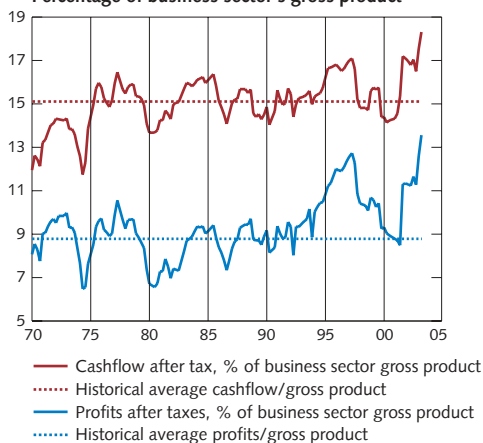
**Figure 18. International producer prices and oil prices in national currencies and weighed together with TCW weights and commodity prices.**  
Percentage 12-month change



Note. The TCW weighting includes eleven countries, which comprise approximately 85 per cent of the total TCW of twenty countries. Commodity prices in Q1, 2004 refer to average for the period 2 January – 19 March.

Sources: The Riksbank, the OECD, the London Metal Exchange and the International Petroleum Exchange.

**Figure 19. Profits and cashflow in the United States.**  
Percentage of business sector's gross product



Note. Profits and cashflow adjusted for stock valuation and fixed capital consumption.

Sources: US Department of Commerce and the Riksbank.

growth in the rest of the world is expected to lead to growth in US exports, which is also supported by the weaker dollar. Favourable demand, strong balance sheets, rising profits (see Figure 19) and low financing costs are also expected to lead to continued positive development in business sector investment. These beneficial conditions have been reflected at the beginning of the year in record-high expectations in the business sector (see Figure 20), rising manufacturing output (see Figure 11) and increased orders. Finally, the low stocks levels and increased demand are expected to lead to an increase in inventory investment once again.

At the end of 2004, growth in the United States is expected to slacken somewhat, mainly as a result of fiscal policy being less expansionary. This, combined with gradually rising interest rates, is expected to somewhat subdue private consumption and housing investment. The prospects for the US economy are expected to be good during 2005, and for 2006 the forecast is for a slightly more rapid growth than is sustainable in the long term (see Figure 21 and Table 2). Household consumption, which accounts for 70 per cent of GDP, is expected to remain an important factor behind growth, largely because of its size. Private investment is assessed to be another significant driving force in the near future. At the same time, the negative net export figures of recent years are expected to become positive during 2005 and 2006.

The forecasts for growth this year and next are being revised upwards, compared with the December Inflation Report. This is partly due to the assessment that private consumption will become stronger. New national accounts figures show that the US household sector's consumption propensity has been unexpectedly high in recent years, which has led to some upward revision to the forecasts for the coming years. Investment is also expected to increase at a more rapid rate than was forecast in December. Finally, the figures for exports have been revised upwards as a result of the weak dollar and the fact that world trade is expected to become slightly stronger.

Normally, employment growth follows developments in manufacturing with some time lag (see Figure 22). However, in this economic upturn employment has increased surprisingly little in relation to the increase in production. There has thus been a substantial increase in productivity (see Figure 22). This has subdued unit labour costs, which has had a positive effect on business sector profits and balance sheets. There are now signs that the labour market is about to stabilise, for instance the number of applications for unemployment benefit has fallen since summer 2003. Employment is expected to increase gradually during the forecast period. At the same time, productivity growth is expected to fall back somewhat, as in the case of previous economic upturns.

Inflation in the United States was slightly lower than expected at the end of last year, while import prices remained low, despite the weaker dollar. This, together with expectations of marginally lower unit labour costs, has contributed to a slight downward revision of the inflation forecast for 2004 and 2005, compared with the December assessment.

#### ■ Gradual recovery in the euro area.



The recovery in the euro area is expected to pick up this year after a very weak development in 2003. Signals received since the December Inflation Report have been mixed. Manufacturing output has continued to increase at a modest rate and business tendency survey data has been positive on the whole (see Figures 11 and 20). At the same time, household sector consumption remains weak and the stronger euro hampers exports. The preliminary outcome for GDP growth during Q4 last year was slightly lower than forecast, which was largely connected with an unexpected reduction in household sector consumption. Investment, which has been weak for the past three years, now showed a slight upturn. Since the December Inflation Report, the forecasts for GDP growth in 2004 and 2005 have been revised down somewhat, mainly due to the strong currency.

The assessment for the labour market is that it has stabilised and a slow recovery is expected. During the course of the economic upturn, productivity is expected to rise gradually from its current low level. The higher level of productivity and a stable rate of wage increase are expected to subdue unit labour costs during the forecast period.

In the coming years, the increasingly strong international economic activity is expected to lead to net exports providing a positive contribution to growth. Household sector consumption will be supported by a gradual improvement in the labour market, moderate inflation and tax reductions in several countries. Investment is also expected to recover in the coming years. Indicators of this are increased international demand, low real interest rates and a stock market upturn. During the initial stage of the recovery some stockbuilding is expected. Public sector consumption is expected to be limited to some extent during the forecast period by the savings requirements imposed on Germany and France by the rules of the stability pact.

The GDP increase in the euro area is expected to approach the long-term sustainable growth rate and then to exceed it in 2005 and 2006 (see Figure 21). However, the assessment is that there will be some measure of unutilised resources in the economy towards the end of the forecast period. Inflation is therefore expected to remain moderate in the coming years.

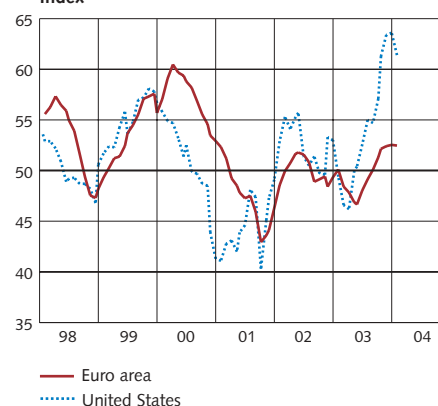
#### ■ Strong export-driven upturn in emerging markets.

During the winter, growth prospects for Asia, eastern and central Europe and Latin America have gradually improved. This positive development has largely been export-driven; supported by the global upturn. Since the December Inflation Report, Japan, which is still the world's second largest economy, has grown more rapidly than many external analysts had anticipated. This is connected with a strong growth in exports, particularly to China, increased corporate investment and rising manufacturing output.

#### ■ Slightly brighter economic prospects in UK and nordic countries.

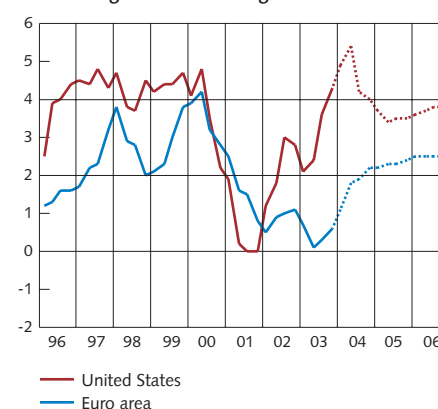
Since the December Inflation Report, the forecast for GDP growth in the United Kingdom and Norway has been revised upwards both for

**Figure 20. United States and euro area: purchasing managers index.**  
Index



Sources: NTC Research Ltd and ISM.

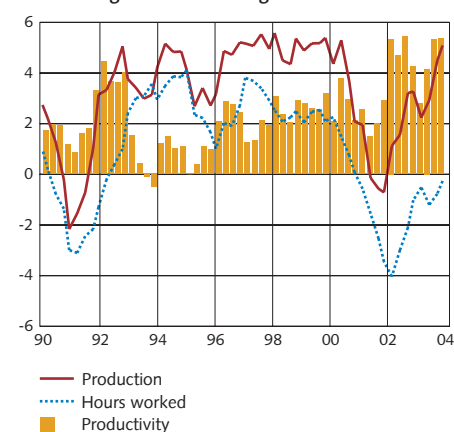
**Figure 21. GDP for United States and euro area, outcome and forecasts.**  
Percentage 12-month change



Note. Broken line represents the Riksbank's forecast.

Sources: US Department of Commerce, Eurostat and the Riksbank.

**Figure 22. Productivity and components, United States.**  
Percentage 12-month change



Source: Bureau of Labor Statistics.

this year and next year. This is because of expectations of continued strong consumption and favourable developments in the labour market. With regard to Denmark and Finland, the picture of economic activity appears largely unchanged from the earlier assessment.

#### Revised forecasts since the December Inflation Report.

- GDP growth in the United States is expected to be stronger both this year and next. This is connected with an upward revision in figures for private consumption and business sector investment and with the expectation that net exports will now provide a positive contribution.
- GDP growth in the euro area is expected to be slightly weaker both this year and next, mainly due to the stronger exchange rate.
- Growth forecasts for Asia, eastern and central Europe and Latin America have been revised up slightly.
- Oil prices have been revised upwards for the entire forecast period. This is partly due to increased demand and reduced production quotas, which is reflected in rising forward rates.
- International inflation is expected to be slightly lower during the forecast period.

**Table 2. International conditions.  
Percentage 12-month change**

	GDP					CPI			
	2002	2003	2004	2005	2006	2002	2003	2004	2005
USA	2.2	3.1 (3.0)	4.6 (4.2)	3.5 (3.2)	3.7	1.6	2.3 (2.4)	1.5 (1.8)	2.0 (2.3)
Germany	0.2	-0.1 (0.0)	1.5 (1.6)	1.9 (2.0)	2.2	1.3	1.0 (1.1)	1.1 (1.1)	1.2 (1.4)
United Kingdom	1.7	2.3 (2.0)	2.8 (2.6)	2.8 (2.7)	2.6	1.3	1.4 ( - )	1.6 ( - )	1.9 ( - )
Denmark	1.0	0.0 (1.0)	1.8 (2.0)	2.3 (2.2)	2.4	2.4	2.0 (2.2)	1.8 (2.0)	1.8 (2.0)
Finland	2.3	1.9 (1.4)	2.5 (2.5)	3.2 (3.2)	2.5	2.0	1.3 (1.4)	1.3 (1.3)	1.8 (1.9)
Norway	1.7	0.7 (0.5)	3.0 (2.3)	2.8 (2.6)	2.5	1.3	2.5 (2.2)	1.3 (2.0)	1.8 (2.5)
Euro 12	0.9	0.4 (0.6)	1.8 (1.9)	2.3 (2.5)	2.5	2.3	2.1 (2.0)	1.7 (1.7)	1.7 (1.7)
TCW-weighted	1.2	1.1 (1.1)	2.4 (2.3)	2.5 (2.5)	2.6	1.7	1.7 (1.9)	1.4 (1.6)	1.6 (1.8)
OECD 19	1.4	2.0 (2.0)	3.2 (2.9)	2.8 (2.7)	2.9	1.4	1.8 (1.9)	1.3 (1.5)	1.6 (1.8)
				2002	2003	2004	2005	2006	
Swedish export market growth				3.4	4.0 (3.8)	6.2 (6.1)	6.8 (6.9)	6.9	
International producer prices				-0.5	0.8 ( - )	1.4 ( - )	1.6 ( - )	1.7	
Crude oil prices, annual average (USD/barrel Brent Blend)				25.0	28.9 (28.8)	31.5 (25.6)	28.2 (22.8)	25.1	

Note. CPI refers to HICP for Germany, the United Kingdom (as of December 2003), Denmark and Finland. In Norway GDP refers to the mainland economy. OECD 19 refers to the EU countries (excluding Luxembourg), the United States, Canada, Japan, Norway and Switzerland. The figures in parentheses are the assessments in the December Report. Market growth for Swedish exports is measured in terms of imports of goods from all countries that are recipients of Swedish exports, weighted with each country's share of Swedish exports of goods 2000-2001. International producer prices in national currencies refer to aggregates of national PPI series for manufactured goods. This aggregate includes 11 countries and is achieved using TCW weights. The countries included are the United States, Germany, the United Kingdom, Norway, Finland, Denmark, Belgium, Japan, Canada, France and the Netherlands. These together comprise approximately 85 per cent of the total TCW weighting. Previously, a series of international export prices for manufactured goods was used. The reason for changing series is that the new series is not published with the same time lag as the earlier one. Historically, these series have developed in a relatively similar manner.

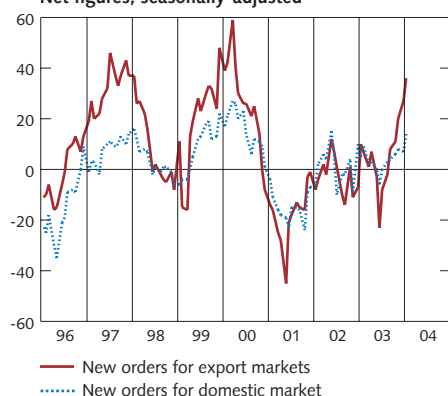
Source: The Riksbank.

## Economic activity in Sweden

*In the December Inflation Report, the Riksbank presented a picture of an economic upswing in which growth would slowly gather pace and the economy would approach full resource utilisation at the end of the forecast period. New data have confirmed this picture. Nevertheless, domestic cost pressure is expected to be muted even though it will intensify towards the end of the forecast period as a larger share of economic resources are employed. The assessment of Swedish economic activity is largely the same as in the December Inflation Report. Demand in the economy is anticipated to accelerate somewhat in the period ahead as a result of the repo rate cut of 0.25 percentage points in February.*

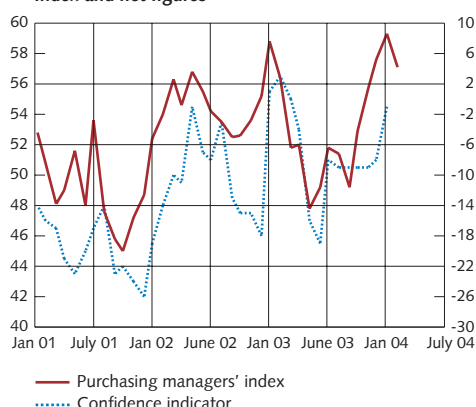
During the second half of last year the recovery in the Swedish economy strengthened, and GDP growth reached 1.6 per cent in 2003. Growth was robust in primarily household consumption and exports of goods, while investment continued to be weak. In 2004 the rise in international economic activity is expected to result in increased growth in Swedish export demand and thereby a further rise in exports. As imports are also anticipated to pick up, the increase in exports does not elicit as large an increase in domestic demand and GDP. Due to higher capacity utilisation in industry and low interest rates, investment is judged to pick up after bottoming out last year. However, owing to the unexpectedly weak outcome for investment in 2003, the increase will be delayed somewhat further. As a result of low interest rates and higher real disposable incomes, household consumption is anticipated to continue to increase, rising in tandem with the economy's long-term growth rate.

Public consumption is expected to grow faster in the current year compared with the assessment in December. This is only a calendar effect. If the figure is adjusted for the larger number of working days this year, growth in underlying public consumption has actually been revised down due to the strained financial situation of local governments. The economic upswing in 2004-2006 that is foreseen in the main scenario is relatively cautious. In all, GDP growth is expected to be 2.8 per cent this year, 2.6 per cent in 2005 and 2.8 per cent in 2006 (see Table 3). The rise in GDP this year is affected by the fact that there are four more working days than in 2003. This has an impact on GDP growth that in the December Inflation Report was judged to be 0.3 percentage points. New estimates by the National Institute of Economic Research (NIER) indicate that the effect on GDP should be twice as big, i.e. 0.6 percentage points. The changed view of the calendar effect has caused the Riksbank to revise up the forecast for actual growth between 2003 and 2004. However, the view of resource utilisation is practically unchanged compared with the December Inflation Report. Resource utilisation is judged to be low initially after which it is expected to rise gradually at the end of the forecast period and approach full capacity utilisation.

**Figure 23. New orders in manufacturing.**  
Net figures, seasonally-adjusted

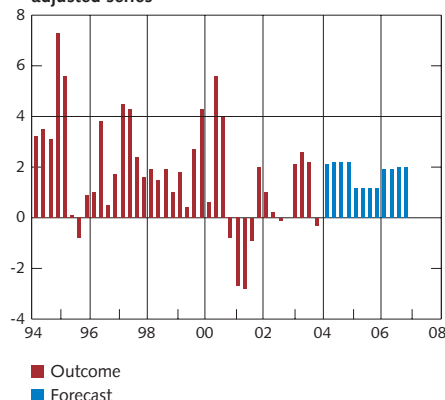
Note. Net figures refers to the proportion of firms that have reported an improvement minus the proportion that have reported a deterioration.

Source: National Institute of Economic Research.

**Figure 24. Business tendency survey: purchasing managers' index and confidence indicator.**  
Index and net figures

Note. Net figures refers to the proportion of firms that have reported an improvement minus the proportion that have reported a deterioration.

Sources: FöreningsSparbanken and the National Institute of Economic Research.

**Figure 25. Exports of goods.**  
Quarterly change in per cent of seasonally-adjusted series

Sources: Statistics Sweden and the Riksbank.

**Table 3. Demand and supply in the main scenario.**  
Percentage 12-month change

	2003	2004	2005	2006
Household consumption	2.0 (1.8)	2.6 (2.3)	2.3 (2.0)	2.4
Public authority consumption	0.7 (0.8)	1.1 (0.6)	0.3 (0.7)	1.4
- central government	0.8 (-0.2)	1.3 (-0.1)	0.1 (0.1)	1.4
- local government	0.6 (1.2)	1.0 (0.9)	0.3 (0.9)	1.4
Gross fixed capital formation	-2.0 (-1.2)	4.8 (4.6)	6.9 (6.0)	4.9
Stockbuilding, contribution	0.2 (0.3)	0.1 (0.1)	0.0 (0.0)	0.0
Exports	5.9 (4.0)	6.8 (4.9)	6.1 (5.8)	6.5
Imports	5.4 (3.9)	7.2 (5.5)	6.3 (5.9)	6.5
GDP	1.6 (1.5)	2.8 (2.4)	2.6 (2.5)	2.8

Note. The forecast refers to actual growth. The figures in parentheses are the forecasts in the December Inflation Report.

Sources: Statistics Sweden and the Riksbank.

### ■ Improved outlook for industry.

The data received in recent months have pointed to a continued recovery in industry. The NIER's business tendency survey for February shows that the confidence indicator for manufacturing has risen to a relatively high level. The purchasing managers' index has also indicated an upswing in industry (see Figure 24). Production volumes have risen, new orders have increased in both the domestic market and export markets, and firms are optimistic about the future (see Figure 23). Moreover, firms are less dissatisfied with their inventories of finished goods. The outcome for industrial production also indicates an upswing in recent months. According to Statistics Sweden, new orders in industry fell between Q3 and Q4 last year but rose again in January. However, both these series from Statistics Sweden are usually revised and so the latest outcomes should be interpreted with caution.

### ■ Stronger rise in both exports and imports.

The recovery in Swedish export market growth and in industrial activity was also reflected in vigorous growth in exports of goods in 2003. Exports of goods increased by 5.1 per cent last year, which is more than forecast in the December Report. Motor vehicles and pharmaceuticals accounted for the biggest rise in exports, according to the foreign trade statistics. The stronger exports are due to higher actual market growth at the same time as relative prices of Swedish exports were lower than expected. Market growth for Swedish goods is judged to have increased by 4 per cent last year. This means that Sweden succeeded in winning market shares. Increasingly robust demand from abroad has improved export prospects over the forecast period and exports are expected to rise. Furthermore, Swedish exports of goods are supported by the fact that developments in relative prices are expected to be weak. Exporters have also become more optimistic about the future. Exports of services recovered last year, increasing by 8.4 per cent. These are now judged to grow stronger during the forecast period compared with the December Report. A change in the method

for gathering statistics in January 2003 makes the forecast uncertain, however.

In 2003 imports of goods rose by 5.5 per cent and services by 5.1 per cent. This was more than expected and was due to stronger growth in both exports and household consumption than forecast in December. The rate of growth in goods imports is judged to accelerate in the years ahead as a result of a higher rate of growth in private sector consumption, increased demand for intermediate goods in the export industry and a rise in gross fixed capital formation. Growth in imports of services is also expected to continue to strengthen. Compared with the December Inflation Report, the forecasts for imports of both goods and services in the years ahead have been revised up. Historically, imports of services have comprised a larger share of GDP than exports of services, but the difference has narrowed since 1980 (see Figure 27). Exports of services are expected to increase somewhat more than imports of services over the remainder of the forecast period as well.

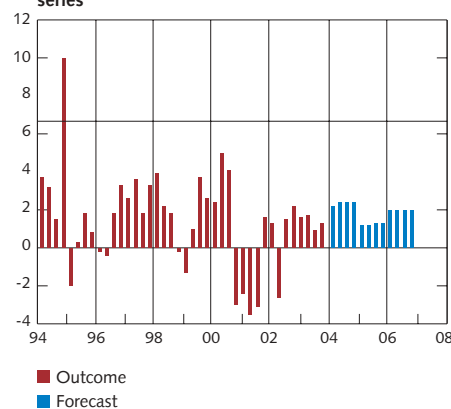
In all, the forecasts of both imports and exports have been revised up compared with the December Inflation Report. Throughout the forecast period, net exports are expected to be positive but fairly small. Net exports in 2004 are estimated to be larger than forecast in December last year. Thus, there will be a substantial surplus in the current account in the years ahead as well.

#### ■ Pick-up in investment begins this year.

Gross fixed capital formation declined 2 per cent in 2003, which was slightly more than anticipated. Given that investment has fallen for three consecutive years at the same time as total production in the economy has risen somewhat, the conditions for a pick-up should be in place (see Figure 28). The drop in interest rates and increase in equity prices can also be expected to stimulate the willingness to invest. However, it is difficult to predict how fast this increase will be. A large number of vacant premises, moderate resource utilisation and savings requirements in the public sector speak against a rapid rise in investment, except perhaps in industry.

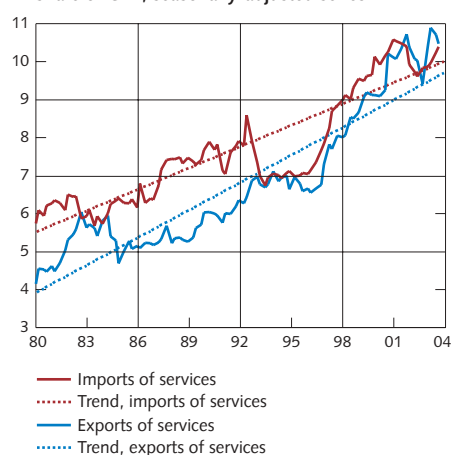
In industry the economic upswing now appears to have progressed somewhat. Export demand has gathered pace and firms are relatively optimistic about the future. Statistics Sweden's surveys show that capacity utilisation in industry has increased steadily since the beginning of 2002, and it is now relatively high in an historical perspective. This rise is due in part to firms in the telecom industry getting rid of spare capacity. At the same time, the NIER's business tendency surveys show that the proportion of firms reporting machinery and plant as primary bottleneck is at an average level. This indicator also points to a small upswing, although it usually rises quickly in economic upturns. Thus, there are some indications that the capital stock in industry needs to be expanded given that demand is expected to mount.

**Figure 26. Imports of goods.**  
Quarterly change in per cent of seasonally-adjusted series



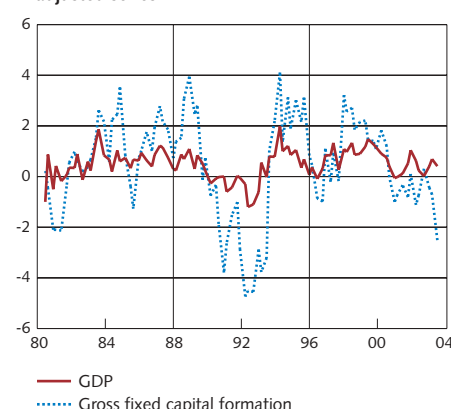
Sources: Statistics Sweden and the Riksbank.

**Figure 27. Imports and exports of services.**  
Share of GDP, seasonally-adjusted series



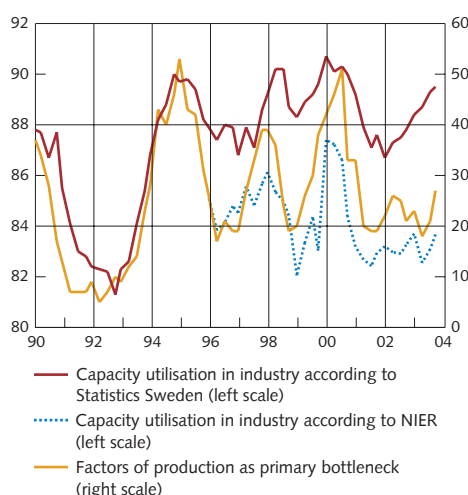
Sources: Statistics Sweden and the Riksbank.

**Diagram 28. GDP growth and investment.**  
Smoothed quarterly changes and per cent of seasonally-adjusted series

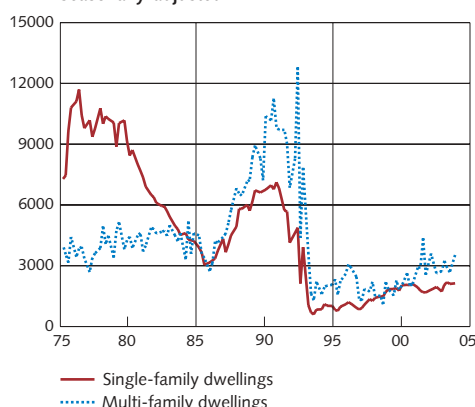


Source: Statistics Sweden.

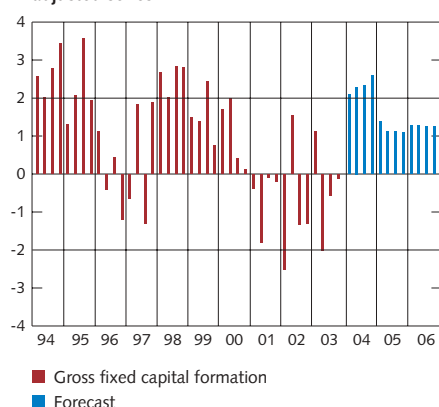


**Figure 29. Capacity utilisation in industry.**  
Per cent

Sources: The National Institute of Economic Research and Statistics Sweden.

**Figure 30. Housing starts: apartments.**  
Seasonally-adjusted

Source: Statistics Sweden.

**Figure 31. Gross fixed capital formation.**  
Quarterly changes as per cent of seasonally adjusted series

Sources: Statistics Sweden and the Riksbank.

In other areas of the business sector, it is generally difficult to find evidence that utilisation of the capital stock is too high at present. A surplus of offices and commercial premises has resulted in a decline in the construction of such premises. In addition, according to the business tendency surveys, construction firms are not expecting any rapid recovery in this area. Moreover, the strained financial situation in the public sector suggests that local governments will continue to hold back investment, at least during 2004 and 2005. However, towards the end of the forecast period, the finances of local governments will allow room for a pick-up in investment. Furthermore, infrastructure investment is expected to rise gradually due to a recent agreement in respect of financing (see "Public finances, consumption and investment"). Investment by service industries fell last year, but it is anticipated to be bolstered by improved economic prospects this year and next year. The expansion of the 3G network for mobile telephony is under way and can be expected to provide a fillip to investment in the coming two years.

Housing construction has risen uninterrupted since 1998, but the rate of increase has been low. In 2003, approximately 23 000 apartments had begun to be built.<sup>5</sup> This was a rise of 19 per cent. Despite this increase, construction activity is still historically low (see Figure 30). Meanwhile, reconstruction projects have also decreased.

In all, gross fixed capital formation is judged to rise by just less than 5 per cent this year and by around 7 per cent in 2005. The increase for 2004 is of the same magnitude as in the December Inflation Report, but consideration has been given to the effect on investment of more working days in 2004, which is now estimated to be greater.

#### ■ Household disposable income expected to rise over the forecast period.

The National Accounts show that households' real disposable income was unchanged in 2003 compared with last year. The unexpectedly weak outcome was mainly due to changed principles for entering household taxes in the National Accounts. The effect of the change is that the differences between preliminary and final tax are now booked during the income year instead of during the following year as was previously the case. Disposable income is now expected to grow somewhat faster in 2004 due to somewhat lower estimated direct taxes and slower inflation. The forecast for the rise in disposable income for 2005 has not changed appreciably. No regulatory changes in the tax and transfer system are expected in 2006, implying growth of around 3.0 per cent in households' real disposable income. This is consistent with growth in the wage sum and real GDP. In all, growth in households' real income is expected to be somewhat stronger than assumed in the December Inflation Report.

<sup>5</sup> This figure is preliminary and the data for the most recent quarter have been adjusted upwards to take account of the under-reporting that often occurs.

## ■ Continued rise in consumption.

Private consumption is determined mainly by households' income and wealth and expectations of how these will develop in the future. The level of interest rates is also important. Households' real disposable incomes are now anticipated to grow somewhat more than in the previous assessment. House prices are expected to continue to rise over the forecast period, partly due to low interest rates and weak housing construction. Households' total wealth is now assumed to increase faster than anticipated in the December Report.

Higher real incomes, low interest rates and somewhat higher wealth suggest that household consumption will gain further momentum this year, after which it will remain largely at the current rate of growth in the coming two years. According to the NIER's Consumer Survey, households have become more optimistic about both the real economy in general and their own finances (see Figure 33). Other indicators of consumption growth, such as retail sales, have risen largely as expected and thereby support the picture of a further increase in consumption this year. At the same time, consumption is judged to be restrained somewhat by the weaker labour market conditions.

## ■ Households borrowing more but able to service debt.

Household debt as a percentage of disposable income continued to rise last year and the debt ratio is now close to levels seen during the sharp expansion in credit at the end of the 1980s. However, as a result of low lending rates, households' interest expenditure as a percentage of disposable income (the interest ratio) is at an historically low level (see Figure 34). The proportion of variable-rate loans has risen in line with a fall in nominal market rates. Variable-rate loans currently comprise around one-third of the outstanding debt stock. Almost 60 per cent of new loans are variable-rate loans.

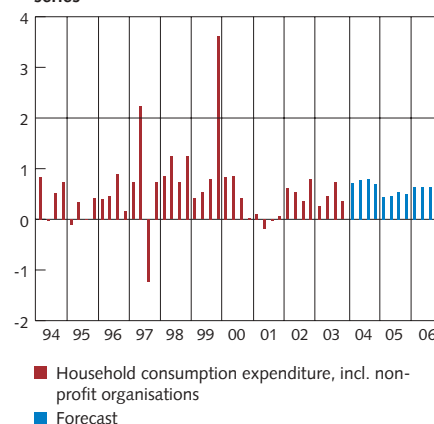
Households' increased wealth is estimated to lead to a reduction in their saving. Thus, households will increase consumption at a higher rate than rises in their disposable income in the years ahead. As a result, the household saving ratio will fall over the forecast period.

## ■ Public finances, consumption and investment.

Preliminary outcomes in the National Accounts for public consumption and investment were largely in line with the December forecast. Since the December Inflation Report, the Government has announced new fiscal measures. Appropriations to the Labour Market Board have been raised by SEK 2 billion in 2004 and local governments will receive an additional SEK 4 billion in general appropriations in 2005. The Government has agreed with its collaboration parties to implement a long-term programme of investment in infrastructure, which is judged to lead to increased central government investment.

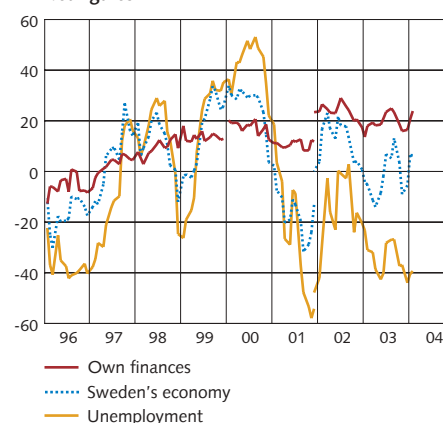
The public sector's financial position is assumed to improve gradually as economic activity strengthens, while expenditure as a percentage of GDP is expected to decline (see Table 4). However, net

**Figure 32. Private consumption.**  
Quarterly changes as per cent of seasonally adjusted series



Sources: Statistics Sweden and the Riksbank.

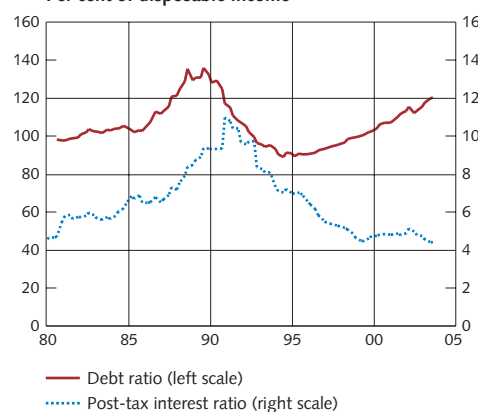
**Figure 33. Households' expectations of their own finances, Sweden's economy and unemployment.**  
Net figures



Note. Net figures refers to the proportion of households that have reported an improvement minus the proportion that have reported a deterioration. The shares are expressed in percentage terms.

Sources: The National Institute of Economic Research and Statistics Sweden.

**Figure 34. Households' debt ratio and interest ratio.**  
Per cent of disposable income



Sources: Statistics Sweden and the Riksbank.

lending in 2004-2005 is anticipated to be lower than forecast in the December Inflation Report.

Adjusting actual net lending for the cyclical effects gives the structural balance, which provides a picture of how big net lending would be in the event of normal capacity utilisation. During the forecast period, the cyclical effects are expected to stimulate demand in the economy since capacity utilisation is assumed to be below its normal level. The structural balance is judged to be around 1.2 per cent over the forecast period.

**Table 4. The public finances.**  
With accrual taxes, level as per cent of GDP

	2003	2004	2005	2006
Income	56.1	55.6	54.7	54.9
Expenditure	55.6	55.0	54.1	53.6
Net lending	0.5	0.6	0.7	1.2
Cyclical balance	-0.8	-0.8	-0.4	-0.1
Structural balance	1.2	1.4	1.1	1.3

Sources: Statistics Sweden and the Riksbank

#### ■ Surplus target not met during the forecast period.

One of the main budgetary goals of Swedish fiscal policy is the surplus target, which is defined as a 2 per cent surplus in general government net lending on average over the business cycle. The aim of the target is to reduce general government debt as a percentage of GDP. Another purpose is to create fiscal scope to guarantee that stabilisation policy measures can be taken and to ensure that automatic stabilisers can act without the deficits in the public finances exceeding 3 per cent of GDP during unfavourable economic conditions. The surplus target can be assessed with the aid of estimates of the so-called structural balance since this is adjusted for cyclical effects. An annual structural balance of around 2 per cent of GDP thus indicates that the surplus target is met. Thus, the figures in Table 4 point to difficulties for the public sector in attaining the surplus target during 2004-2006.

There is great uncertainty attached to calculations of the structural balance, and different methods can produce markedly different results. The reason for these differences is that the methods are based on various estimates of resource utilisation in the economy. Table 5 below compares the results of two different methods that differ in their estimate of the size of the output gap. The first is the HP method, which estimates the output gap solely by filtering GDP time series. The second is an estimate of the output gap based on several different indicators of resource utilisation in the economy. The latter estimate has been used in Table 4.

**Table 5. Structural balance 2003-2006, different methods.**  
Per cent of GDP

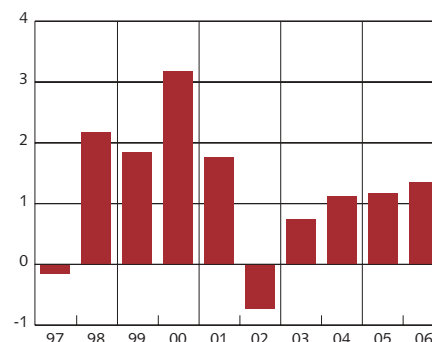
	2003	2004	2005	2006
Alternative method	1.2	1.4	1.1	1.3
HP method	0.7	1.1	1.2	1.4
Average	1.0	1.2	1.1	1.3

Source: The Riksbank.



The HP method produces an estimate of the structural balance that is lower during 2003-2005 and higher in 2006 than that derived using the alternative method. Neither of the two methods indicates that the general government surplus target will be reached during the forecast period. Figure 35 depicts the structural balance for the years 1997-2006 where the HP method has been used to estimate the output gap. Measured in this way, estimates suggest that the structural balance exceeded 2 per cent of GDP in 1998, 2000 and 2001. On average, actual net lending with accrual taxes is expected to be 1.4 per cent of GDP between 1997 and 2006. Thus, the surplus target is not met according to this method of estimation either. The forecast general government surplus is estimated to be due to the old-age pension system (see Table 6).

Figure 35. Structural balance 1997–2006, HP method. Per cent of GDP



Sources: Statistics Sweden and the Riksbank.

Table 6. Net lending in different sectors. Per cent of GDP

	2003	2004	2005	2006
Old-age pension system	2.0	2.0	2.0	2.0
Local government sector	-0.2	0.1	0.2	0.4
Central government	-1.4	-1.4	-1.5	-1.2

Sources: Statistics Sweden and the Riksbank.

### ■ Risk of central government expenditure exceeding the ceiling.

The expenditure ceiling for an individual budget year is established by Parliament (the Riksdag) according to a rolling schedule three years in advance. If no measures are taken, the Riksbank judges that central government expenditure will exceed the Government's ceiling in 2004 but will be below the ceiling in 2005 and 2006 (see Table 7). The budget margin is the difference between the budgeted expenditure subject to the ceiling and the expenditure ceiling. This margin is intended for dealing with unexpected events. It is judged to be very small and considerably smaller than the established margin for 2004-2006.<sup>6</sup>

Table 7. Central government expenditure ceiling. SEK billion

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditure ceiling	723	720	753	765	791	812	822	856	894	931
Expenditure subject to ceiling	699	718	752	760	786	812	822	860	892	924
Budgeting margin	24	2	2	5	5	0	0	-4	2	7

Note. The expenditure ceiling has not been adjusted for technical adjustments.

Sources: The Ministry of Finance and the Riksbank.

### ■ Central government budget deficit throughout forecast period.

The forecast for growth in central government consumption at fixed prices has been revised up to 1.3 per cent for 2004 (see Table 8).<sup>7</sup>

This is due to the increased appropriations to the National Labour Market Board. The forecast for 2005 is unchanged. The forecast for

<sup>6</sup> In the spring budget bills, the budgeting margin has been set at an average of SEK 23 billion.

<sup>7</sup> The upward revision is also due to a calendar adjustment owing to the greater number of working days in 2004 than 2003.

growth in central government investment at fixed prices has been revised up to -0.5 per cent for 2004 and 8.9 per cent for 2005 due to infrastructure investment.

As can be seen in Table 8, a deficit is foreseen in central government net lending throughout the forecast period, but the deficit is expected to decrease towards the end of the forecast period. The expenditure ceiling and surplus target are of great significance for this development. By not allowing expenditure to exceed an established target, net lending for the central government is determined mainly by its revenue, which is judged to increase as the economy picks up. Compared with the December Inflation Report, central government net lending is anticipated to be lower in 2004-2005. This is partly because of the discretionary measures announced by the Government since the December Report.

**Table 8. Central government finances: central government debt and gross debt. Percentage 12-month change (at fixed prices), SEK billion and per cent of GDP**

	2003	2004	2005	2006
Consumption	0.8	1.3	0.1	1.4
Investment	2.0	-0.5	8.9	-2.1
Net lending (SEK billion)	-34	-36	-40	-33
Central government budget balance (SEK billion)	-46	-54	-41	-34
Central government debt (SEK billion)	1186	1237	1283	1317
Per cent of GDP	48.6	48.6	48.0	47.2
Consolidated gross debt (SEK billion)	1266	1343	1384	1418
Per cent of GDP	51.9	52.8	51.7	50.8

Sources: Statistics Sweden and the Riksbank.

The central government budget balance will be largely the same as net lending, except in 2004. The budget balance, which corresponds to the borrowing requirement with the reverse sign, shows a deficit throughout the forecast period. This means that the central government debt will rise in absolute terms. The central government debt is estimated to increase by SEK 131 billion between 2003 and 2006. As a share of GDP, however, the debt will fall over the forecast period. The consolidated gross debt for the entire general government sector will rise in kronor as a result of the increased central government debt but will decrease as a percentage of GDP.

#### ■ Continued strained finances in local governments.

Many local governments are having difficulty meeting the balanced-budget requirement. According to this requirement, a budget deficit must be balanced by an equivalent surplus within two years. In the assessments of local government finances, the Riksbank has taken account of the announced general appropriations of SEK 4 billion. Moreover, as in the December Inflation Report, local governments are expected to raise taxes by an additional SEK 0.20 on average in 2005. Despite these measures, local government finances are anticipated to be strained during the forecast period. The forecast for local government consumption in 2004 has been revised up, but this is due solely

to a calendar effect. Adjusted for variations in the number of working days, growth in local government consumption is judged to be considerably lower in 2004 compared with the December Inflation Report. The forecast for consumption growth in 2005 has been revised down. However, consumption growth is anticipated to be higher in 2006 in line with an improvement in local government finances (see Table 9). The forecast for local government investment in 2004 has also been revised down sharply. Unlike consumption, investment is expected to pick up by 2005.

**Table 9. Local government finances and demand.**  
Percentage 12-month change (at fixed prices), SEK billion

	2002	2003	2004	2005	2006
Consumption	2.8	0.6	1.0	0.3	1.4
Investment	7.2	-8.9	-5.0	1.7	2.7
Net lending (SEK billion)	-14	-4	2	6	12
Budget balance (SEK billion)	-9	-2	0	4	10
Accumulated deficit (SEK billion)	-9	-11	-11	-7	4

Sources: Statistics Sweden and the Riksbank.

#### ■ Deterioration in the labour market in 2003.

Over the course of 2003, unemployment rose steeply from 4.5 per cent in January to 5.4 per cent in December in seasonally-adjusted terms.

In average annual terms, the labour supply increased by around 30 000 persons between 2002 and 2003. At the same time, the number of employed dropped by approximately 10 000. The decline in employment was particularly sharp in industry. The mean working time for the employed fell due to a continued increase in absence from work and a reduction in negotiated working hours.

The working age population, i.e. between 16-64 years, has increased relatively strongly in recent years and is expected to do so in the coming years as well. This has contributed positively to the labour supply even though it is mainly older and younger age groups that have risen in number, i.e. groups that generally have a low activity rate. Last year local governments implemented cutbacks in adult secondary education, which also led to a rise in the labour supply.

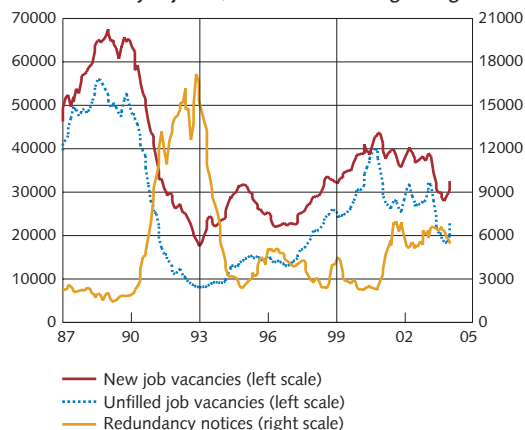
#### ■ Weak signs of a turnaround.

As yet there has been no turnaround in employment. However there are some, albeit weak, signs that labour demand may be about to rebound. In the last few months the number of new job vacancies has increased somewhat in seasonally-adjusted terms, although the improvement is small compared with the decline over the larger part of last year. The NIER's business tendency surveys show that labour shortages have increased in several sectors, but they are still low. Moreover, there has been a small drop in the number of redundancy notices (see Figure 36).

The latest sick-leave data from the National Social Insurance

**Figure 36. New and unfilled vacant jobs with a duration of more than 10 days and redundancy notices.**

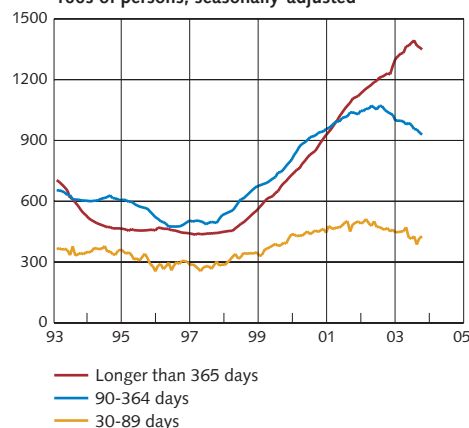
Seasonally adjusted, three-month moving average



Source: National Labour Market Board.

**Figure 37. Breakdown of sick leave according to length of absence.**

100s of persons, seasonally-adjusted



Source: National Social Insurance Board.

**Figure 38. Absence due to illness and sick leave as a percentage of the number of employed.**

Percentage year-on-year change and per cent, seasonally-adjusted, three-month moving average



Source: Statistics Sweden.

Board indicates that sick leave has peaked (see Figure 37). Statistics Sweden's labour force surveys show the same result. In recent months, sick leave numbers have decreased. This may be partly due to the early retirement of long-term sick, although short-term sick leave also appears to have declined somewhat.

#### ■ More pessimistic outlook for employment.

In the December Inflation Report, the number of employed was forecast to rise marginally in annual average terms between 2003 and 2004. However, the weak developments at the end of last year advocate a downward revision of the employment forecast for 2004. Nonetheless, employment is expected to pick up again towards the end of the current year, as forecast previously by the Riksbank. Historically, employment reacts to a change in production with a certain lag.

In industry, there has been a trend decline in employment for a long period. After the crisis at the beginning of the 1990s, the number of employed in industry rose somewhat, after which it stabilised up to 2001 when a new decline set in. It is unlikely that any appreciable recovery is to be expected even if industrial production is rising faster. It is more probable that employment in industry will again level off. In construction, employment has risen for a long period in spite of subdued activity. The increase is most likely to continue given the forecast pickup in investment. This means that housing construction will continue to rise and that plant construction will gather pace during the latter part of the forecast period.

In the private services sector, the shortage of labour is currently insignificant. However, the continued improvement in growth should lead to a rise in employment in service industries. For example, the National Labour Market Board expects demand for IT staff to begin to pick up.<sup>8</sup> On the other hand, employment growth in the public sector is anticipated to be very weak, at least during 2004 and 2005. The strained finances of local governments are even expected to result in staff cutbacks in some areas. In 2006, local government finances are judged to improve and provide scope for some employment growth.

In the current year, the labour supply is not expected to increase compared with 2003; the supply will be dampened when there is a rise in the number of labour market programmes. However, in the years ahead the number of persons in the labour force can be expected to increase slightly. This is because there will be more people of working age and because demand for labour will mount. Given that employment is only anticipated to increase by the latter part of 2004, unemployment will edge up between 2003 and 2004. Thereafter, unemployment is expected to fall slowly.

<sup>8</sup> The National Labour Market Board, "Var finns jobben 2004?" (Where are the jobs in 2004?).

**Table 10. Labour market forecast.**  
Percentage 12-month change

	2003	2004	2005	2006
Labour force	0.7 (0.7)	0.0 (0.1)	0.2 (0.3)	0.4
Employed	-0.2 (-0.1)	-0.2 (0.1)	0.3 (0.4)	0.7
Mean working time	-1.2 (-0.8)	0.9 (0.3)	0.2 (0.0)	0.2
Usual working time	-0.5	-0.2	-0.2	0.0
Number of working days	-0.4	1.6	0.0	-0.8
Absence	-0.3	0.0	0.2	0.3
Overtime, additional working time	-0.2	0.0	0.2	0.3
Number of hours worked	-1.3 (-0.8)	0.6 (0.5)	0.6 (0.5)	1.0
Open unemployment, per cent of labour force	4.9 (4.8)	5.0 (4.8)	4.9 (4.6)	4.7
Labour market programmes, per cent of labour force	2.1 (2.1)	2.0 (1.9)	2.0 (1.7)	2.0

Note. The figures in parentheses are the forecasts in the December Inflation Report.

Sources: Statistics Sweden and the Riksbank.

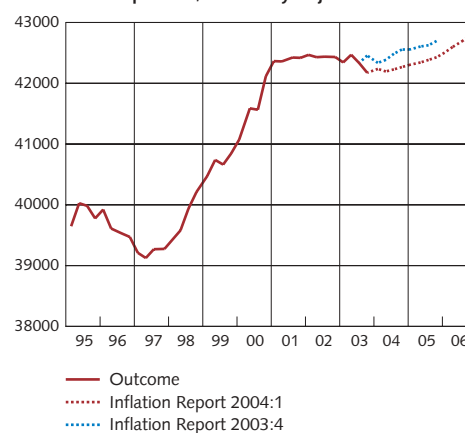
### ■ Mean working time to rise again.

Due to the fact that 2004 has four working days more than last year, the number of hours worked will rise between 2003 and 2004. The calendar effect on hours worked in the total economy has been estimated at approximately 0.9 percentage points. But it is uncertain whether the increase will be as large since the change in mean working time is also affected by developments in absenteeism, overtime, etc. During 2005 and 2006, higher growth and increasing resource utilisation is also expected to contribute to the number of hours worked rising somewhat quicker than the number of persons employed. The current low levels of overtime can therefore be assumed to increase during the economic upswing.

In all, the number of hours worked is judged to increase marginally in 2004 despite a slight fall in the number of employed. In 2005 and 2006, the number of hours worked is expected to rise somewhat faster than the number of employed.

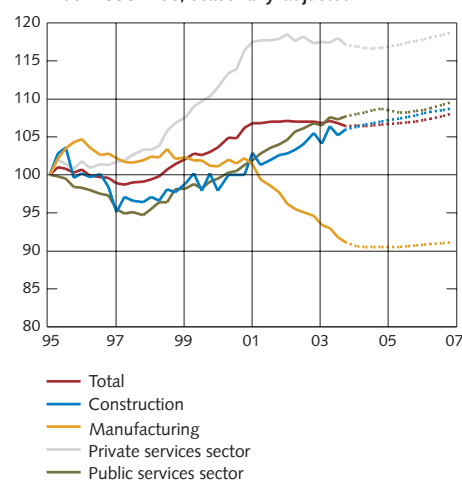
### ■ Slow rise in resource utilisation.

Most factors indicate that resource utilisation in the economy is still comparatively low. It is mainly in industry that it has tended to rise. Statistics Sweden's surveys have shown that capacity utilisation in industry has risen for several consecutive quarters. This rise is largely attributable to the telecom industry, which has got rid of spare capacity. But increases have been reported by several industrial sectors. Moreover, a number of indicators in the NIER's business tendency surveys suggest that resource utilisation in industry is rising, although the surveys indicate that the rate of utilisation in industry is still low. In service industries such as computer consultants and other business services, capacity utilisation appears to have remained low. Estimates indicate that the output gap is negative, according to both the production function approach and the HP filter (see Figure 43). The combined assessment of factors such as the estimated output gaps, shortages and unemployment suggests that resource utilisation in the

**Figure 39. Employment.**  
100s of persons, seasonally-adjusted

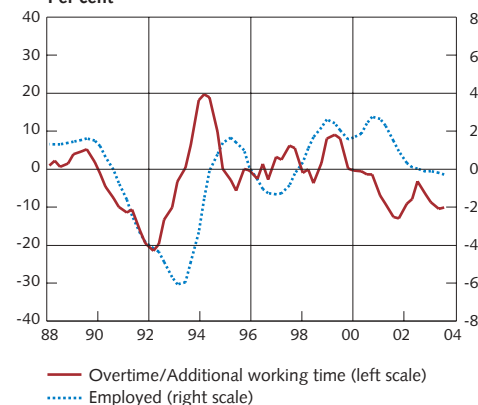
Note. Broken line represents the Riksbank's forecast.

Sources: Statistics Sweden and the Riksbank.

**Figure 40. Employment in different sectors.**  
Index 1995=100, seasonally-adjusted

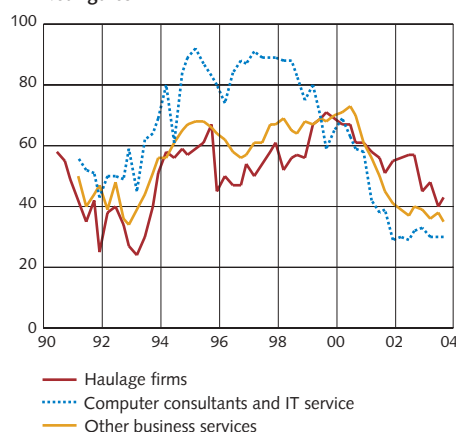
Note. Broken line represents the Riksbank's forecast.

Sources: Statistics Sweden and the Riksbank.

**Figure 41. Overtime/additional working time in hours and number of employed.**  
3-quarter moving average of year-on-year changes, Per cent

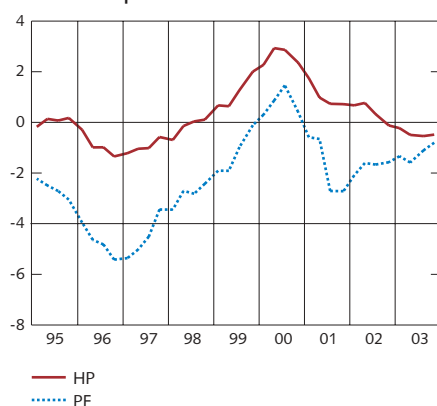
Source: Statistics Sweden.

**Figure 42. Proportion of firms with full capacity utilisation in some service industries. Net figures**



Source: National Institute of Economic Research.

**Figure 43. Econometric estimates of the output gap. Per cent of potential GDP**



Note. HP stands for the Hodrick-Prescott (or Whitaker-Henderson) filter. PF is the production function approach.

Sources: Statistics Sweden and the Riksbank.

economy is comparatively low. In 2005 and 2006, growth is expected to be strong enough to give rise to an increasingly higher rate of resource utilisation and the economy will approach full capacity utilisation.

However, the robust productivity growth may indicate a higher potential production capacity and that the amount of unutilised resources is greater than assumed in the previous assessment. It is, however, too early to determine whether the recent productivity gains are a sign of a higher long-term level of productivity growth (see the box "How persistent is the recent rise in productivity?").

The Riksbank's interpretation of the low inflationary pressure in the Swedish economy is not connected to a new assessment of resource utilisation. The combined assessment of resource utilisation in the forecast period is largely the same as in the December Inflation Report. Instead, the low inflation is seen mainly as an expression partly of low imported inflation and partly of low domestic cost increases. The latter is due, among other things, to higher productivity growth, both that observed so far and the expected rate.

#### ■ Strong productivity growth.

In 2003, labour productivity rose by approximately 3 per cent in the total economy and by 3.7 per cent in the business sector. This was better than expected in the December Report. Production has increased largely as anticipated while the number of hours worked has fallen more than expected. The rise in productivity seen at the beginning of this economic upswing differs somewhat from the historical pattern. There are signs that the structural changes of the 1990s may have resulted in slightly higher average productivity growth. However, it is always difficult to determine how much of the increase in productivity has cyclical causes and how much is due to structural factors (see the box "How persistent is the recent rise in productivity?"). It has been assumed in the forecast that productivity growth will slacken as production gradually picks up and firms once again increase their demand for labour.

#### ■ Moderate wage increases expected.

Since the December Inflation Report, preliminary wage statistics for the full year 2003 have been received. According to Statistics Sweden's short-term wage statistics, the rate of wage increases in the business sector slowed last year (see Figure 44). Wages rose by 3.3 per cent year-on-year, which was a drop of 0.7 percentage points. The construction sector differed from this pattern, however, with wage increases remaining at the same level as 2002. In the public sector, the rate of wage increases has diminished owing to weaker finances. Wages here rose by 3.8 per cent in 2003, compared with 4.5 per cent in 2002. Wage rises in the business sector have been in line with the forecast in the December Inflation Report. However, the costs of white-collar workers' pensions proved somewhat higher than



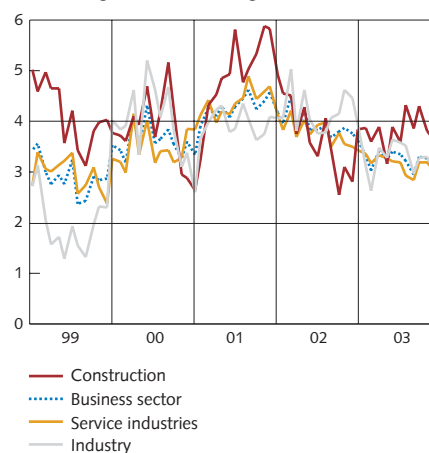
indicated in the preliminary data. Total wage costs in the business sector are now judged to have increased by 4.7 per cent in 2003, which is 0.2 percentage points higher than assumed in the December Inflation Report. In the public sector, the rate of increase appears to have been slightly lower, and the forecast has been revised down by 0.3 percentage points to 3.8 per cent (see Table 11).

Following a longer period of negotiations, the Swedish Trade Union Confederation and the Confederation of Swedish Enterprise have signed an agreement that improves conditions for private-sector employees in the event of redundancy. The parties have agreed to earmark 0.3 per cent of the wage sum to finance the system. The Government has proposed a new system for sick pay to apply from 1 January 2005. Higher costs for firms will be compensated through lower social security contributions. For employers as a whole, the proposal is intended to be cost-neutral. It is still unclear how the system will be designed.

Wage agreements for approximately 300 000 industrial employees have been signed. The agreements included reductions in working hours, guaranteed wage rises for all employees, and a prioritisation of low-wage groups. On average, the wage agreements in industry entail increased costs for firms of 2.4 per cent per year including the costs of shorter working hours. Thus, the agreed wage hikes were approximately halfway between the levels agreed in the previous wage bargaining round in 2001 and the wage negotiations in 1998. The wage agreement in industry is expected to serve as a norm for other areas of the labour market. Agreements have also been settled for 120 000 employees in the retail trade sector. The negotiated wage rises for this group averaged 3 per cent per year.

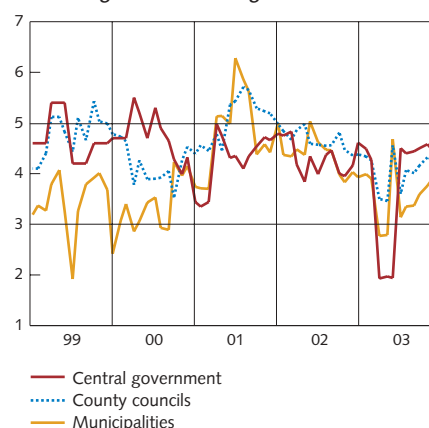
In the December Report, weak demand in the labour market was forecast to lead to moderate wage rises in 2004 and 2005. Since then, the outlook for employment growth has become somewhat more pessimistic. Therefore, compared with the December Report, the estimated wage drift and thereby the forecasts for wages in both the business sector and public sector in 2004 and 2005 have been revised down (see Table 11). However, given that other wage costs are expected to be somewhat higher, total wage costs in the business sector are judged to be unchanged in 2005 compared with the December forecast. Towards the end of the forecast period, wage increases in the business sector are expected to approach 3.7 per cent, which has been the average outcome in the three last agreement periods, 1998-2003. Wages in the public sector are forecast to rise by 3.6 per cent in 2006, which is lower than recent years.

**Figure 44. Nominal wage increases, business sector. Percentage 12-month change**

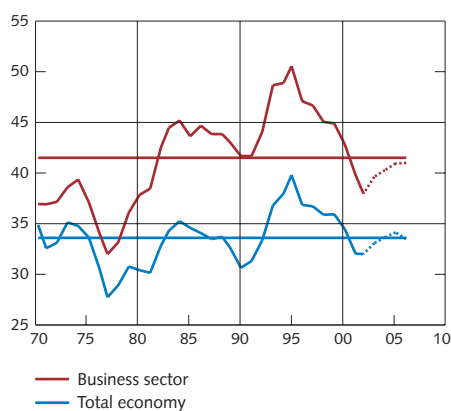


Source: The National Mediation Office.

**Figure 45. Nominal wage increases, public sector. Percentage 12-month change**



Source: The National Mediation Office.

**Figure 46. Profit share.  
Per cent**

Note. The horizontal lines are the averages for the period 1970-2002. The broken line represents the Riksbank's forecast.

Sources: Statistics Sweden and the Riksbank.

**Table 11. Wages and unit labour costs.  
Percentage 12-month change**

	2003	2004	2005	2006
Nominal wages according to short-term wage statistics, total economy	3.5 (3.6)	3.5 (3.7)	3.6 (3.8)	3.7
Nominal wages according to short-term wage statistics, business sector	3.3 (3.3)	3.4 (3.5)	3.5 (3.6)	3.7
Other wage costs, business sector, contribution	1.3 (1.1)	0.3 (0.3)	0.2 (0.1)	0.2
Total wage costs according to short-term wage statistics, business sector	4.7 (4.5)	3.6 (3.8)	3.7 (3.7)	3.8
Total hourly wage costs in business sector, short-term wage statistics adjusted for number of working days	4.9	2.8	3.7	4.2
Average labour productivity, business sector		2.7 (2.2)	2.4 (2.1)	2.2
Unit labour costs, business sector		0.2 (1.6)	1.3 (1.6)	2.1

Note. The items do not sum up due to rounding. The figures in parentheses are the forecasts in the December Inflation Report.

Sources: Statistics Sweden and the Riksbank.

### ■ Weaker domestic cost pressure.

Stronger productivity growth coupled with lower wage rises per hour worked implies weaker domestic cost pressure compared with the assessment in the December Inflation Report. Unit labour costs increased by 1.2 per cent last year, which was around 0.4 percentage points lower than expected. Cost pressure is judged to intensify over the forecast period in line with rising wages and slacker productivity growth (see Table 11). Unit labour costs in the business sector are expected to increase by 0.2 per cent this year and then rise towards 2 per cent at the end of the forecast period. The lower costs in 2004 due to a larger number of working days are reflected partly in higher profit shares and partly in low price increases (see Figure 46).



**Revised forecasts since the December Inflation Report.**

- New estimates of the calendar effects on GDP raise the forecast for growth in 2004 by 0.3 percentage points.
- Outcomes for exports and imports in 2003 were stronger than forecast. Low relative prices imply a somewhat faster rise in exports in 2004 and 2005. As a result of stronger expected growth in consumption, exports and investment in 2004 and 2005, the forecast for imports has been revised up.
- Owing to higher real disposable incomes, lower interest rates and higher asset prices, household consumption is expected to accelerate in 2004 and 2005.
- The rise in investment has been delayed further. This entails a downward revision of the forecast for the annual average in 2004 but an upward revision for the 2005 forecast.
- As a result of calendar effects, the forecast for public authority consumption in 2004 has been revised up. Weaker local government finances have prompted a downward revision of the forecast for public consumption in 2005.
- Mean working time is assumed to be higher in 2004 and 2005. The higher figure for this year is largely due to estimates of the calendar effects.
- The forecast for employment this year has been revised down owing to unexpectedly weak employment growth at the end of 2003.
- Productivity gains in the business sector are expected to be higher throughout the forecast period.
- Wage increases in the business sector are assumed to be somewhat lower in 2004 and 2005 as a result of poorer labour market conditions.
- Domestic cost pressure in terms of unit labour costs is judged to be lower in 2004 and 2005.

## Calendar effects on production, hours and costs

**The number of working days varies from year to year, depending on when public holidays fall. In the current year, the number of working days is unusually large. This box analyses the significance of these calendar effects for production, the number of hours worked and firms' costs.**

An average year has approximately 251 working days. The number of working days in 2003 was two fewer than this, i.e. 249. The current year has one extra day due to it being a leap year, and public holidays fall to a large extent on Saturdays and Sundays. The number of working days this year totals 253, or two more than average. It is exceptional to have a difference as large as four working days between two consecutive years. Thus, the calendar effects on working hours, production and productivity are unusually large between 2003 and 2004.

In this Inflation Report, a new assessment has been made of the calendar effects on GDP growth and hours worked. The new estimates are based on preliminary results from the National Institute of Economic Research. The estimates are of course uncertain. Furthermore, it is the impact on inflation of all changes in the economy that is the central issue for monetary policy. Nevertheless, in order to understand the inflation forecast, it is important to get an idea of the approximate significance of the calendar effects in 2004.

The elasticity of GDP with respect to the number of working days is now estimated at 0.4. As 2004 has 1.6 per cent more working days, this gives an effect on GDP growth of 0.6 percentage points ( $1.6 \times 0.4$ ). This is 0.3 percentage points more than the assessment in the December Inflation Report. Actual growth is expected to be 2.8 per cent and calendar-adjusted growth is anticipated to be 2.2 per cent (see Table B1).

The elasticity for the number of hours worked in the total economy is estimated to be 0.6 and in the business sector 0.5, which is twice the estimate in the

previous Inflation Report. The calendar effects on the number of hours worked in the total economy are thereby 0.9 percentage points this year, compared with 0.8 percentage points in the business sector.

As the calendar effects on hours are assumed to be greater than on production, this means that actual productivity growth will be lower than calendar-adjusted productivity growth this year.

Statistics Sweden's short-term wage statistics disregard the number of working days and weight together the percentage changes in the figures from blue-collar workers' hourly wages and white-collar workers' monthly salaries to a series that excludes calendar effects. The outcome of the short-term wage statistics will thereby overestimate actual growth in hourly wages during 2004. As a result of the calendar effects, employees with monthly salaries will work more hours without being compensated through higher pay. In this way, growth in actual hourly wage costs in the business sector will be lower than the wage costs indicated by the short-term wage statistics.

The combined effects on hours, production and wage costs, due to the fact that the number of working days in 2004 is greater than last year, entail that actual unit labour costs are estimated to be lower than the calendar-adjusted figure. In 2006, the calendar has the opposite effect on unit labour costs; actual unit labour costs will exceed the calendar-adjusted costs.

Besides the consequences of the new estimates of the calendar effects, the forecasts of productivity and wage costs are also affected by revisions caused by economic developments. In all, as a result of these revisions and the new estimates of calendar effects, the rise in unit labour costs both this year and next year is now judged to be lower than in the previous Inflation Report (see also Table 11).

Relatively sharp variations in actual unit labour costs are not unusual between individual years. Unit labour costs also vary more than inflation, which indicates that firms tend to even out fluctuations in costs and productivity in their pricing.

**Table B1. Production, hours and wage costs: actual and calendar-adjusted.**

	2004		2005		2006	
	actual	calendar adjusted	actual	calendar adjusted	actual	calendar adjusted
GDP, total	2.8 (2.4)	2.2	2.6 (2.5)	2.6	2.8	3.1
GDP, business sector	3.1 (2.7)	2.6	3.1 (2.9)	3.1	3.1	3.3
Hours, business sector	0.4 (0.6)	-0.4	0.7 (0.8)	0.7	0.9	1.3
Productivity, business sector	2.7 (2.2)	3.0	2.4 (2.1)	2.4	2.2	2.0
Wage costs, business sector	2.8 (3.8)	3.6	3.7 (3.7)	3.7	4.2	3.8
Units labour costs, business sector	0.2 (1.6)	0.7	1.3 (1.6)	1.3	2.1	1.8

Note. The data refer to forecasts of percentage changes. The figures in parentheses are the forecasts in the December Inflation Report.

Source: The Riksbank.

## Inflation expectations

The inflation expectations of households and firms are an important factor in the Riksbank's monetary policy analysis since they affect inflation via price and wage formation. Inflation expectations reflect a number of factors, including the Riksbank's communication and actions, actual inflation and general developments in the macroeconomy.

Households' inflation expectations rose somewhat during the winter but have now begun to fall back to lower levels. According to the National Institute of Economic Research (NIER), households in February expected an inflation rate of 1.9 per cent one year ahead, which is a marginal rise since the December Inflation Report (see Figure 47).

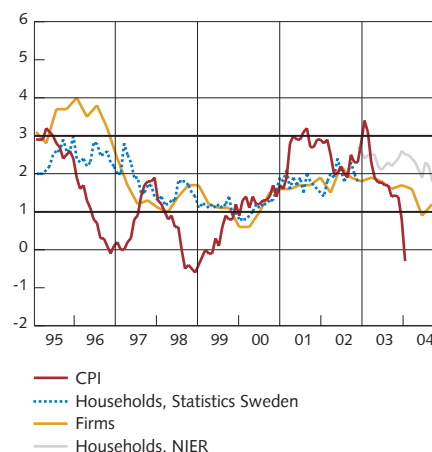
The inflation expectations of manufacturing firms and service companies remain low. In the January business tendency survey of the NIER, the firms' expectations of inflation one year ahead were anchored at 1.2 per cent, which was unchanged compared with the October survey. The expectations have mirrored the manufacturing industry's prices in the domestic market, which have also been more or less unchanged over the same period (see Figure 48).

Prospera's latest survey in March points to lower inflation expectations among all surveyed groups, both in the short and long term, compared with the November survey (see Table 12). The survey participants now expect inflation to average 1.9 per cent one year ahead, which is 0.3 percentage points lower than in November. Expectations of inflation two to five years ahead have been revised down by 0.2 percentage points and are now anchored at 2.2 per cent. The low expectations are probably to a large extent a result of low actual inflation.

Money market agents expect inflation of 1.5 per cent one year ahead, which is the lowest rate foreseen by this group since the end of 1999. They expect inflation to increase somewhat two to five years ahead to stand at around 2 per cent. At the same time, money market agents also anticipate an unchanged repo rate over the coming three months.<sup>9</sup> They expect the repo rate to be raised to 2.75 per cent within one year and to 3.5 per cent within two years.

**Figure 47. CPI and inflation expectations of households and firms.**

Per cent

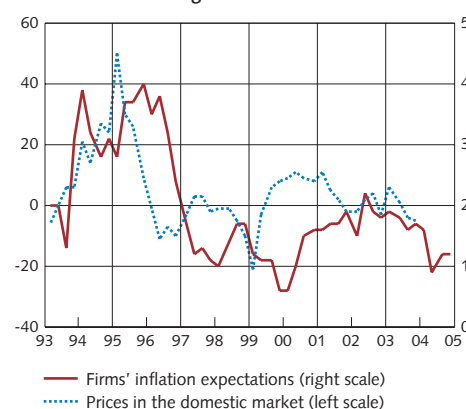


Note. The curves for inflation expectations have been displaced 12 months ahead to coincide with the CPI outcomes to which the expectations refer. The procedure for surveying households' purchasing plans was changed in January 2002.

Sources: The National Institute of Economic Research and Statistics Sweden.

**Figure 48. Firms' inflation expectations one year ahead and manufacturing industry's sales prices in the domestic market.**

Per cent and net figures



Note. The curves for inflation expectations have been displaced 12 months ahead.

Source: National Institute of Economic Research.

<sup>9</sup> Money market agents' expectations regarding the repo rate were surveyed on 3 March 2004.

**Table 12. Expected 12-month rates of inflation according to Prospera's survey in March 2004, unless otherwise specified.****Per cent****1 year ahead**

Money market agents	1.5 (-0.3)
Employer organisations	1.8 (-0.3)
Employee organisations	1.8 (-0.2)
Purchasing managers, trade	2.1 (-0.3)
Purchasing managers, manufacturing	2.2 (-0.3)
Households (HIP) in February (January)	1.9 (-0.1)
Firms (business tendency survey) in January (October)	1.2 (0.0)

**2 years ahead**

Money market agents	1.9 (-0.2)
Employer organisations	2.0 (-0.2)
Employee organisations	1.9 (-0.2)
Purchasing managers, trade	2.3 (-0.1)
Purchasing managers, manufacturing	2.4 (-0.2)

**5 years ahead**

Money market agents	2.0 (-0.1)
Employer organisations	2.0 (-0.2)
Employee organisations	2.2 (0.0)
Purchasing managers, trade	2.3 (-0.2)
Purchasing managers, manufacturing	2.4 (-0.2)

Note. The figures in parentheses are the change in percentage points from the previous survey in November 2003, unless otherwise specified.

Sources: National Institute of Economic Research and Prospera Research AB.

## Economic activity and the labour market

**T**his boxed article analyses the relationship between developments in economic activity and the labour market. The results do not support the view that the Swedish labour market has in general been unusually weak over the past one to two years. Both employment and unemployment have, if anything, been surprisingly positive given the economic climate. On the other hand, hours worked appears to have had an unusually weak development. The relationship between the labour market developments and the recent increase in productivity is also discussed.

Last year open unemployment increased by 0.9 percentage points, employment fell by 0.2 per cent and the number of hours worked declined by 1.3 per cent. However, forecasters such as the Riksbank and the National Institute of Economic Research succeeded fairly well in assessing developments in open unemployment and employment (see Figures B1 and B2). With regard to employment, the forecasts at the beginning of the year even indicated a slighter weaker development than the actual outcome. This was mainly due to an initial underestimation of employment in the public sector.

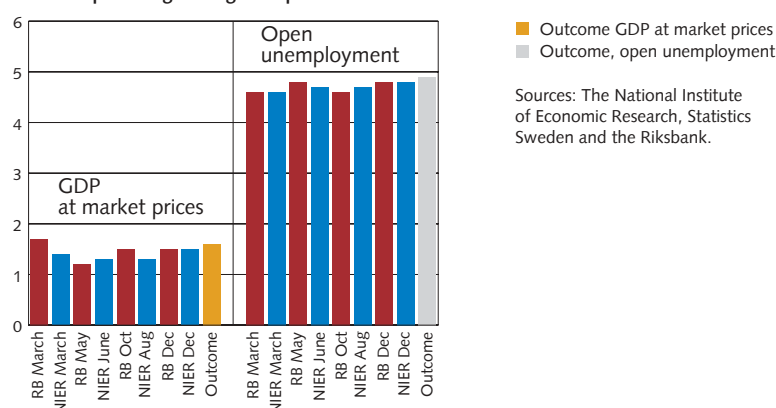
With regard to developments in the economy as a whole, it was only the change in the number of hours worked that was surprisingly negative.<sup>10</sup> Although the forecasts were gradually adjusted downwards over the year, the reduction was still being underestimated as recently as in December. This applies in particular to the Riksbank's forecast (see Figure B2). At the same time, the assessments of GDP growth for the whole of 2003 were largely in line with the actual outcome (see Figure B1).

### *Some similarities between Swedish and US labour markets*

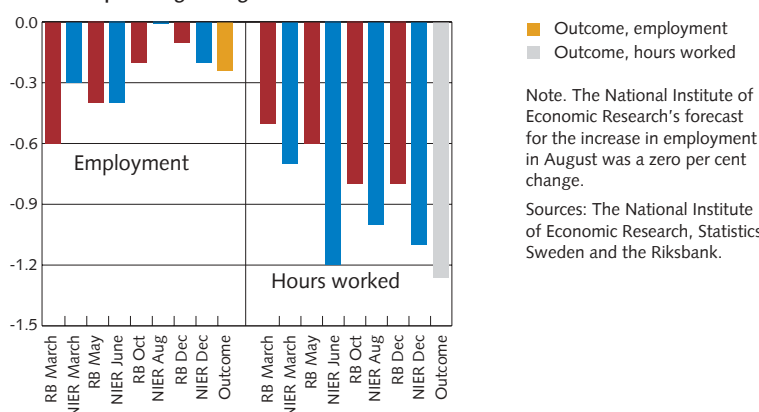
It is not only Sweden that has experienced weak labour market development recently. Despite the fact that the US recovery has now been in progress for a couple of years and

has moreover been stronger than the Swedish recovery, employment has not yet picked up. This phenomenon, known as jobless growth, was observed in the United States during the previous upturn, but it is even more evident in the present recovery. The fact that US employment growth has been even weaker than that in Sweden is illustrated by the size and scope of the misjudgements by various forecasters. In the case of the United States, both employment and the number of hours worked were substantially overestimated in both 2001 and 2002 (see Figure B3).

**Figure B1. GDP growth and open unemployment 2003: forecasts by National Institute of Economic Research and the Riksbank and outcome.**  
Annual percentage change and per cent



**Figure B2. Employment and number of hours worked 2003: forecasts by National Institute of Economic Research and the Riksbank and outcome.**  
Annual percentage change



Note. The National Institute of Economic Research's forecast for the increase in employment in August was a zero per cent change.

Sources: The National Institute of Economic Research, Statistics Sweden and the Riksbank.

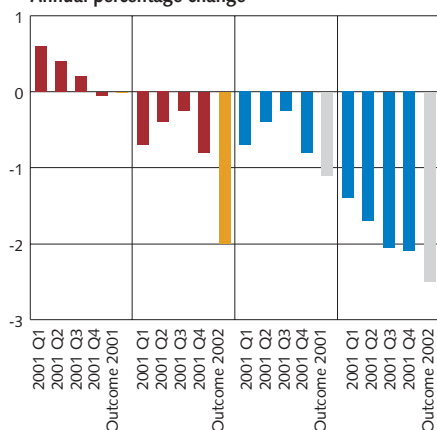
<sup>10</sup> As the forecasts for employment were fairly accurate, the forecast errors for hours worked are largely due to an overestimation of the average working hours. The picture for the business sector is largely the same.

■ Employment  
■ Hours worked

Note. The forecasts are from Goldman Sachs. There are no Consensus forecasts available for the above variables. In general, however, the Goldman Sachs forecasts appear to be in line with the Consensus forecasts. The number of hours worked refers to the private sector excluding agriculture. Please note that the outcome for employment in 2001 was zero percentage change.

Sources: Bureau of Labor Statistics and Goldman Sachs.

Figure B3. Forecasts for changes in employment and number of hours worked in the United States 2001 and 2002 and outcome. Annual percentage change



A relatively high level of GDP growth and weak development in the number of hours worked is normally reflected in rapid productivity growth. In Sweden, productivity growth has been around 3 per cent on average over the past two years, which can be compared with around 2 per cent during the years 1995-2001. The figure for the business sector was an increase of around 4 per cent in 2002-2003, which is approximately two percentage points higher than in 1995-2001. In the US business sector, productivity increased by an average of 3.9 per cent in 2001-2003, which is just over 1.5 percentage points higher than in the period 1995-2000. As the development of hours worked was overestimated in both Sweden and the United States, the increase in productivity in both countries was also unexpectedly high.

There is nothing remarkable about a productivity increase in an economic upturn. During the initial phase of the upturn, firms increase their rate of utilisation of the existing labour force instead of recruiting new staff. After a while, when the economic upturn has been underway for some time and has been consolidated, a need to recruit new staff arises. At this stage, productivity normally slackens

and employment begins to increase. However, the long period of high productivity that has characterised the US economy in particular raises certain questions regarding this explanation for the increase in productivity. One possible interpretation is that this development is linked to the large-scale IT investments made at the end of the 1990s and that these are now beginning to provide productivity gains even outside of the actual IT-producing sectors (see the boxed article "How persistent is the recent rise in productivity?" in this report).<sup>11</sup> The question that arises here is whether this can be an explanation of why the labour market has shown weak development in Sweden, too, or whether the cause is instead simply that the Swedish economic recovery has not been in progress as long or been sufficiently strong.

#### *Okun's law describes how economic activity affects the labour market*

A well-known relationship between the economic cycle and the state of the labour market is that described as Okun's law. This can be interpreted as a short-term correlation and expresses the relationship between changes in economic activity and cyclical activity in the labour market.<sup>12</sup> Okun's law is therefore a natural starting point for a discussion of how economic activity affects the labour market. This article presents estimates applying Okun's law to three different measures of activity in the labour market: unemployment, employment and number of hours worked. By studying how well this law manages to predict recent labour market developments, it is possible to obtain an indication of to what extent developments can be regarded as cyclical or due to other factors unrelated to the economic cycle.<sup>13</sup>

Making estimates according to Okun's law requires a measure of the economic cycle.

<sup>11</sup> Another hypothesis is that tax changes to stimulate investment and low interest rates, combined with a continuing rise in labour costs have led to an increase in capital intensity. This has in turn contributed to both increased productivity and weak developments in employment.

<sup>12</sup> During the first months of the Kennedy administration, economist Arthur Okun was asked by the Council of Economic Advisers to estimate the increase in GDP that would follow on from a reduction in US unemployment from 7 per cent to 4 per cent. This led to Okun's well-known discovery that an increase in US production of 3 per cent went hand in hand with a reduction in unemployment of approximately 1 percentage point. See Okun, A.M., "Potential GNP: Its Measurement and Significance", in *Proceedings of the Business and Economic Statistics Section, American Statistical Association*, Washington, D.C., 1962, pp 98-103.

<sup>13</sup> Okun's law is "one of the best empirically fitted economic relationships" according to Nobel prize winner James Tobin. See Gylfason, T. (ed.), *The Swedish model under stress*, Economic Policy Group report 1997, Centre for Business and Policy Studies (SNS), Stockholm.

One possible measure is the output gap, which measures deviations in aggregate production from a long-term trend, sometimes known as potential production. The simplest method, which is used here, is to assume a linear relationship to estimate the trend.<sup>14</sup> The gap – or the cyclical component of GDP – is then calculated as the difference in per cent between actual GDP and trend GDP. The cyclical components in unemployment, employment and the number of hours worked can be calculated in a corresponding manner. These labour market gaps are related in the estimates to the production gap. To capture persistency in the data and obtain the best possible fit, the estimated equations include time lags of both the labour market gap and the production gap.

#### *Estimates of Okun's law on the Swedish labour market*

The estimates of the various Okun relationships are reported in Table B2. The results show that an increase in the production gap of approximately 1.5 percentage points is related to a reduction in the labour market gap of around 1 percentage point within just over one year (coefficient *b* in Table B2). This estimate is in

line with earlier studies.<sup>15</sup> However, the active labour market policy in Sweden means that open unemployment also varies according to changes in measures by the National Labour Market Board (AMS). If the corresponding estimate is instead made for total unemployment (including AMS measures) a stronger exchange is obtained between the economic cycle and unemployment and an almost 1:1 relationship; an increase in the GDP gap of 1 percentage point is then linked to an equally large reduction in the total unemployment gap.

It is more difficult to obtain a clear preliminary perception of how the estimated relationships between economic activity and the cyclical components in the number of hours worked and employment respectively should look, as these relationships are not as empirically fitted. The estimates based on the number of hours worked give a 1:1 relationship one year ahead, just like the estimates based on total unemployment.

The estimates of the cyclical component of employment give an even larger exchange with economic activity than the estimates based on the number of hours worked. An increase in the output gap of 1 percentage point is connected with an increase in the employment gap of 1.4

**Table B2. Estimate result of Okun's law applied to three different labour market gaps for the period Q1, 1980 to Q4, 2001.**

Estimated coefficients	Open unemployment	Employment	Hours worked
$a_0$	-0.12 (4.73)	0.20 (4.86)	0.53 (6.17)
$a_1$	-0.03 (1.06)	0.07 (1.29)	0.08 (0.65)
$a_2$	-0.05 (1.66)		-0.23 (2.06)
$a_3$	0.04 (1.52)	-0.06 (1.24)	-0.05 (0.59)
$a_4$	0.03 (1.17)	0.04 (0.68)	
$b$	-0.64	1.39	1.01
adjusted R <sup>2</sup>	0.98	0.99	0.91
Box-Ljung Q(9)	0.14	0.33	0.59
No. of observations	84	84	85

Note. The estimated equations are  $x_t = \sum a_i y_{t-i} + \sum c_j x_{t-j} + e_t$ , where  $y$  is the output gap,  $x$  the labour market gap and  $e$  a residual. The figures in parenthesis are t-values. Box-Ljung is a test for serial correlation which indicates significant serial correlation if the value is below 0.05. The total "long-term" effect is calculated as  $b = \sum a_i / (1 - \sum c_j)$ .

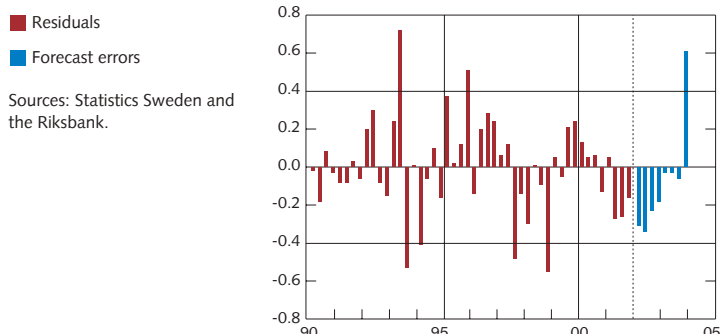
Sources: Statistics Sweden and the Riksbank.

14 The reason for selecting a linear trend is that this method is very simple and proves to work well with regard to estimates of Okun's law. In practice, a trend has been calculated using an HP filter, where the variability of the trend is very low (the adjustment parameter has been set at 100,000). It should be noted that this trend differs from the trend that forms a basis for the calculations of the output gap in Figure 43 of this Inflation Report.

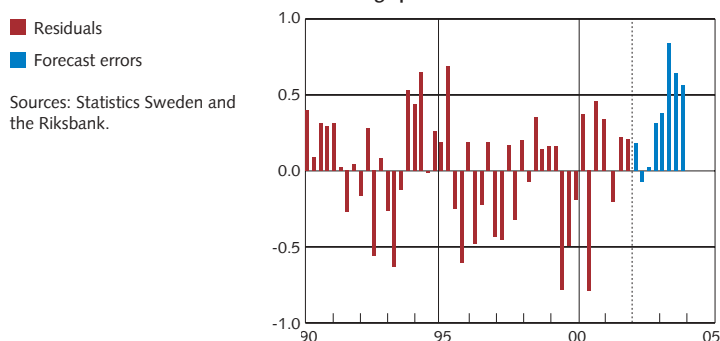
15 Later estimates of Okun's law on US data have observed a relationship of 2:1, that is to say, that a reduction in the GDP gap of 1 percentage point increases the unemployment gap by around half a percentage point. Estimates using Swedish data also usually give this relationship. See, for instance, Gylfason, T. (ed.), *The Swedish model under stress*, Economic Policy Group report 1997, Centre for Business and Policy Studies (SNS), Stockholm, and Apel, M. and P. Jansson, "System Estimates of Potential Output and the NAIRU", *Empirical Economics* 24, 1999, 373-388.



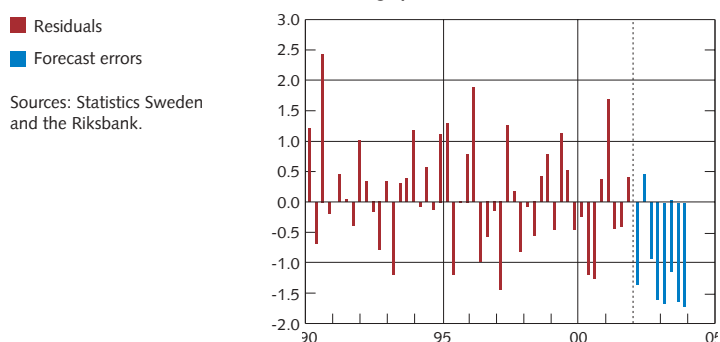
**Figure B4. Residuals and forecast deviations from Okun's law for open unemployment.**  
Percentage points



**Figure B5. Residuals and forecast deviations from Okun's law for employment.**  
Percentage points



**Figure B6. Residuals and forecast deviations from Okun's law for the number of hours worked.**  
Percentage points



These “forecasts” are then compared with the corresponding “actual” gap, which is calculated using actual outcome and a trend throughout the entire period (up to end of Q4, 2003) for unemployment, employment and number of hours worked. If the differences between the actual gap and the forecasts are substantial and systematic (series correlated) there are signs that developments deviate from earlier patterns, that is to say, it does not appear that economic activity alone can explain developments in the labour market. Figures B4-B6 show both the residuals from the estimated relationships up to the end of Q4, 2001 and the differences between outcome and forecasts for 2002 and 2003.<sup>16</sup>

*The relationships indicate surprisingly positive developments in unemployment and employment*

The deviations from forecast for the unemployment gap show that (cyclical) unemployment was lower in 2002 than indicated by historical relationships (see Figure B4). For 2003 the deviations are small, apart from Q4, when unemployment was much higher than normal for the corresponding phase in the economic cycle. All in all, it can be observed that forecast errors indicate slightly greater systematics than previously, but that the errors imply that unemployment has rather been surprisingly low over the past two years (with the exception of Q4, 2003). However, the forecast errors can hardly be said to be particularly large from an historical perspective; the residuals have on several earlier occasions been much larger than the forecast errors in 2002 and 2003.

The forecast deviations for the employment gap show a systematic underestimation of cyclical employment, especially during 2003 (see Figure B5). This means that the employment gap developed more positively than the development indicated using Okun's law. As in the case of the unemployment gap, the picture here is rather that developments have been surprisingly strong, given the economic situation. In relation

percentage points five quarters ahead, that is to say, an increase in cyclical employment of 1 percentage point goes hand in hand with an increase in the output gap of 0.7 percentage points.

The estimates in Table B2 refer to the period Q1, 1980 to Q4, 2001. Using these estimates as a basis, it is possible to calculate an expected development for the labour market gap in 2002 and 2003 (referred to hereafter as “forecast”).

<sup>16</sup> The forecasts are based on the actual GDP developments in 2002 and 2003.



to the relationship's earlier residuals, the forecast errors appear to be slightly larger than for the unemployment gap, but they are still not of a remarkable size.

*The number of hours worked is overestimated by Okun's law*

However, the picture is different with regard to the forecast errors for the estimates based on the number of hours worked. It is quite clear that the forecast errors are both very systematic and unusually large in an historical perspective (see Figure B6). As the forecast errors are negative throughout, applying Okun's law in this case gives a clear overestimate of the actual developments. It is worth emphasising that the results for the number of hours worked differs significantly on this particular point from the results for unemployment and employment. It is only for this variable that the results indicate that developments in 2002 and 2003 were actually unusually weak (disregarding the increase in unemployment Q4, 2003).

To summarise, the analysis in this article does not support the view that the Swedish labour market has in general been unusually weak over the past one to two years. A simple correlation between economic activity and activity in the labour market shows that both employment and unemployment have, if anything, been surprisingly positive given the economic climate. However, the picture is quite different for the number of hours worked. Here the relationship gives a relatively significant overestimate of developments in both 2002 and 2003. It is interesting to note that this pattern for forecast errors also applies to the actual forecasts of the National Institute of Economic Research and

the Riksbank, despite the fact that they are not based on such a simplified relationship.

The fact that the development in the number of hours worked does not appear to be a simple cyclical phenomenon raises interesting questions regarding the recent growth in productivity. If the number of hours worked does not increase to the same extent as in previous economic upturns, this may be an indication of a productivity increase of a more radical nature, perhaps similar to that observed in the United States. However, it is important to note in this context that the US economy is characterised by an economic upturn that has been in progress for longer and been stronger than what we have seen in the Swedish economy so far. In addition, there are differences in the developments of the labour markets. In contrast to Sweden, developments on the labour market in the United States have been very weak during the past two or three years and characterised by both unexpected declines in employment and falls in the number of hours worked. Given this, there is reason to closely follow productivity growth in Sweden in the near future and to be aware of its consequences for developments in the number of people employed and for unemployment (see also the boxed article "How persistent is the recent rise in productivity?" in this report).

It should also be emphasised that the results in this article may be affected by the choice of measuring the trend and cyclical components in the variables examined. However, the general conclusion should remain: employment and unemployment have not developed in a particularly unusual manner in recent years, taking into account the economic situation. On the other hand, the number of hours worked has.

## How persistent is the recent rise in productivity?

**T**his box discusses the recent rise in productivity growth, with a particular focus on the parallels between Swedish and US developments as well as on the role of information technology. Certain similarities exist between the two countries, and it is possible that the increase in productivity will remain high for a number of years, especially if the rise is a delayed effect of previous IT investment. However, it is too early to determine the exact causes of the higher productivity.

A debate is currently under way in the United States as to why employment has not yet picked up despite the fact that the economic recovery is into its third year. Recent developments in Sweden have displayed some parallels with this jobless recovery. In spite of clear signals of

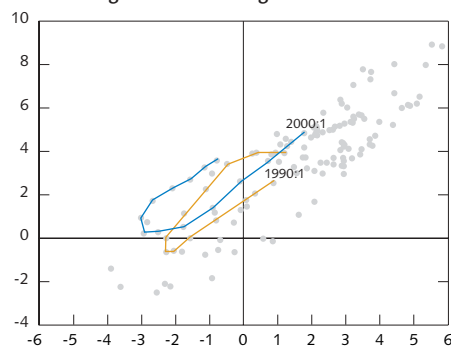
changes that will cause productivity growth to be faster for a number of years ahead? This is a significant question for monetary policy, as longer-term rises in productivity increase the opportunities for combining high economic growth with low inflation.

### *The rise in productivity growth*

The reasons for the strong productivity growth and weak employment have been discussed at length in the United States, and a similar discussion has also begun in Sweden. It is therefore interesting to see if there have been parallels between the United States and Sweden over the past decade, parallels that could be of importance for estimating how persistent the rise in Swedish productivity could be.

What is unusual about the US situation is illustrated in Figure B7, which shows productivity growth in relation to the change in the number of hours worked in the business sector over the period 1971-2003. Here it can be seen that growth in production and growth in hours worked have normally tracked one another (the dots in the upper right and lower left corners of the Figure). But at the beginning of the 1990s there were signs of a change – rises in production were combined for several quarters with declines in hours worked (yellow line). This pattern has become increasingly clear since 2000 (blue line).

**Figure B7. Annual growth in production (vertical axis) and hours worked (horizontal axis) in the United States 1971-2003.**  
Percentage 12-month change



Note. The series refer to the business sector and are seasonally adjusted. The series have been smoothed with a 5-quarter centred moving average. The data used in the calculations have been taken from the period 1971 Q1 to 2003 Q4.  
Source: Bureau of Labor Statistics.

stronger domestic economic activity, the number of hours worked was weak in both 2002 and 2003. As in the United States, a rise in production has been possible thanks to unexpectedly robust productivity growth, and there are many indications that the recent gains in productivity have been unusually large for this stage of the business cycle (see the box "Economic activity and the labour market").<sup>17</sup> In the business sector, productivity rose by approximately 4 per cent in 2002 and, according to the most recent quarterly data from the National Accounts, the increase was equally sharp in 2003.

The question is what this entails for future developments. Have there been structural

Figure B8 shows that there have been tendencies towards similar patterns in Sweden in recent years, but also that such a situation is not as uncommon here. The Swedish economy has experienced similar periods before, particularly in the 1970s but also in the middle of the 1990s. One interesting circumstance, however, is that the turnaround has been relatively long in coming during this business cycle compared with previous cycles (the dots representing the five most recent quarters are very close together in the upper-left corner without any tendency to move towards the upper-right corner). Indications that the number of hours worked is on the road to improvement are thus not as clear as in the United States (where the dots have recently

<sup>17</sup> Here, productivity refers to labour productivity, measured as production per hour worked. Developments in total factor productivity (TFP) are discussed later.

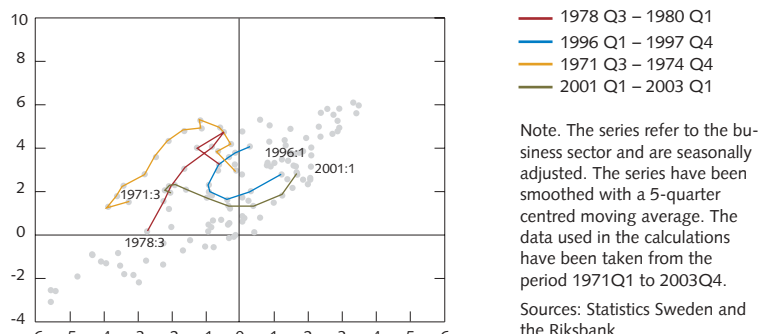
begun to move to the right). However, this could partly be explained by a lag in the Swedish business cycle compared with that in the US.

The illustrations of the relationships between growth in production and growth in hours worked are interesting as they give an indication (particularly in the case of the United States) that the underlying growth in productivity may have changed. In the United States, the improvement in productivity growth has been analysed in detail. Most analysts currently agree that the underlying increase in productivity rose again from the mid-1990s after a long period of stagnation. It is also possible that this rise became stronger during the first years of this decade. Figure B9 shows how productivity growth in the United States rose after 1995 and how the rate of growth appears to have accelerated further around 2001. There is reason to believe that the rate will slow somewhat as the business cycle matures and the labour market recovers, but the question is how long this will take and how the trend rate will develop.

Figure B10 shows the corresponding situation in Sweden. Here too, there are many indications that there was a rise in underlying productivity growth over the 1990s. The crisis at the beginning of that decade was preceded by a decline in productivity growth, which was followed by a sharp upswing due in part to a cyclical recovery. However, productivity growth has remained at a high level since the mid-1990s, indicating a more persistent change.

In conjunction with the crisis at the beginning of the 1990s, there also began a rapid redistribution of the labour force from low-productivity to high-productivity sectors, and from the public to the private sector.<sup>18</sup> Furthermore, labour-intensive processes were moved to emerging markets, where labour force costs are lower. Moreover, in the wake of the crisis there followed a number of structural changes that are possible causes of the higher productivity growth. Increased macroeconomic stability has

**Figure B8. Annual growth in production (vertical axis) and hours worked (horizontal axis) in Sweden 1971-2003. Percentage 12-month change**

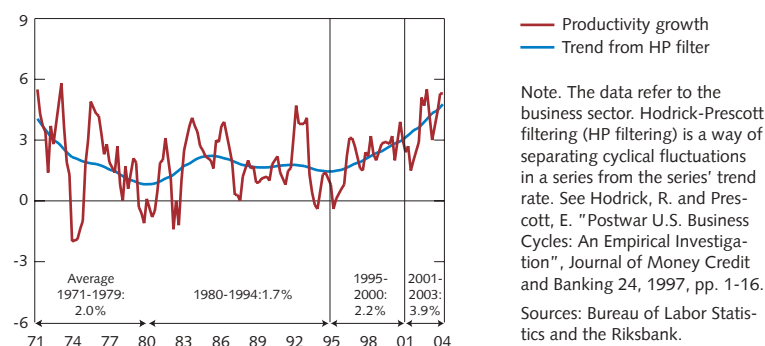


gradually lessened uncertainty in the business sector. As a result of reforms in product and financial markets and increasing exposure to international competition, the OECD now ranks Sweden among the countries that together with the United States have the most efficient product markets. But since the mid-1990s, the factor that has received particular attention in both the United States and Sweden is information and communication technology (ICT).

#### *The significance of ICT for productivity growth*

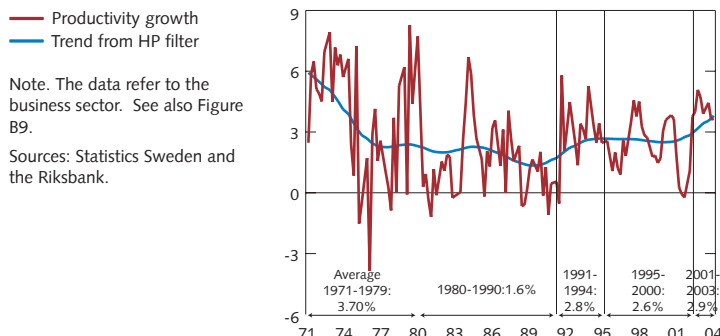
The first distinct contribution from ICT to the faster rise in productivity is from the actual produc-

**Figure B9. Productivity growth in the United States, 1971-2003. Percentage 12-month change**



<sup>18</sup> More than one-quarter of the productivity growth in industry during 1991-2001 can be explained by employment shifts between sectors, according to Lind, D., "Svensk industriproduktivitet i ett internationellt perspektiv under fyra decennier - kan vi lära oss av 1990-talet?" (Four decades of Swedish industrial productivity in an international perspective - can we learn from the 1990s?), *Ekonomisk Debatt* 31(5), 2003, pp. 39-48. In the United States, large parts of the changes in employment are structural rather than cyclical according to Groshen, E. and Potter, S. "Has Structural Change Contributed to a Jobless Recovery?", *Current Issues in Economics and Finance* 9(8), August 2003.

**Figure B10. Productivity growth in Sweden, 1971-2003.**  
Percentage 12-month change

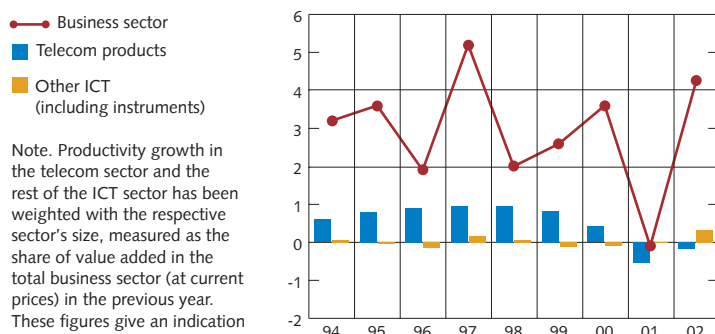


Note. The data refer to the business sector. See also Figure B9.

Sources: Statistics Sweden and the Riksbank.

tion of ICT products. In both the United States (mainly computers and software) and Sweden (telecom products), the ICT sector was important for the increase in productivity during the period 1995-2000 (Figure B11). Some uncertainty exists regarding the measurement methods, not least in the Swedish telecom sector. The value of both the telecom products and intermediate goods in the sector (electronics components) is arrived at by studying the relationship between price and performance (e.g. processor speed and capacity to connect calls), using hedonic price indices. As this involves highly specific technical systems, Statistics Sweden relies to a large degree on data from the telecom producers themselves, which according to certain studies risks leading to incorrect estimates.<sup>19</sup>

**Figure B11. Productivity growth in the ICT sector (weighted) and in the business sector in Sweden, 1994-2002.**  
Percentage 12-month change



Note. Productivity growth in the telecom sector and the rest of the ICT sector has been weighted with the respective sector's size, measured as the share of value added in the total business sector (at current prices) in the previous year. These figures give an indication of the sectors' importance for productivity growth in the business sector but should not be interpreted as strict contributions.

Sources: Statistics Sweden and the Riksbank.

The picture is complicated by the fact that much of the production of telecom products and their components has been moved in recent years to low-wage countries while R&D has remained in Sweden. At current prices, the contribution from the telecom sector has changed somewhat less dramatically. During the period 1993-2000, its share of total value added in the business sector rose from around 1 per cent to 2 per cent, after which it fell back. Had productivity in the ICT sector not been higher than in other technologically advanced industrial sectors during this period, the rise in productivity growth in the business sector as a whole would not have been as sharp.

However, since 2001, the ICT sector in the United States and particularly the telecom sector in Sweden have experienced a steep decline. Thus, it appears that the strong recovery seen in productivity in the past two years cannot be attributed to the telecom sector. In the United States, the focus of the debate has shifted from productivity in ICT production to the effects of ICT investment on the rest of the economy. The amount of capital per hour worked, capital intensity, increased up to and including 2000 at the same time as ICT capital as a percentage of total investment rose during the 1990s (Figure B12).

In Sweden the increase in capital intensity was not as sharp, but on the other hand ICT capital as a percentage of total investment more than doubled in 2001 compared to 1990. However, once again there is uncertainty over statistical computation methods. For example, unlike many European countries, Sweden and the United States use hedonic price indices for ICT hardware, where improvements in performance (for instance, processor speed) are treated as a rise in volume. Furthermore, software is classified as an investment product to a greater extent in Sweden and the United States than in other countries. According to some estimates, these methods exaggerate the significance of ICT capital in comparison with other countries such as Germany and the United Kingdom.<sup>20</sup> Nevertheless, the fundamental picture is the same: the price

19 Edqvist, H., "The Swedish ICT Miracle – Myth or Reality?", SSE/EFI Working Paper Series in Economics and Finance No. 556, Stockholm School of Economics, 2004.

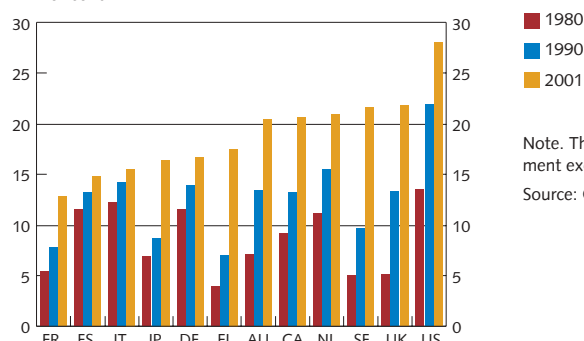
20 See the box "Problems with the measurement of information technology's effects on growth in the United States, Sweden and Europe" in the Inflation Report 2000:4, as well as Colecchia, A. and Schreyer, P. "The Contribution of Information and Communication Technologies to Economic Growth in Nine OECD Countries", *OECD Economic Studies* 34, 2002/1

of ICT performance has fallen sharply, and this has made it easier to replace both other capital and labour with ICT capital.

In 2001, however, investment in general and ICT investment in particular came to a sudden halt, probably due to the equity market decline and a reassessment by firms that they had overinvested in ICT and were excessively indebted. Capital deepening was restrained in Sweden and decreased in the United States. Nonetheless, production per hour increased unusually steeply during the slowdown thanks to the other component of productivity that cannot be explained by additions of capital per hour worked (see Figure B13). This component, total factor productivity (TFP), is instead usually attributed to technological and organisational improvements.<sup>21</sup> One reason put forward by economists for the rise in TFP is that it is only now that we are able to see the delayed impact on workplace organisation of the large-scale investment in ICT capital at the end of the 1990s.<sup>22</sup>

Historically, the impact of technological changes has lagged since it takes time to adapt an organisation and technology to each other in order to fully take advantage of the innovations. This is why it took a long time before the electrification at the beginning of the 1900s had an effect on productivity.<sup>23</sup> The argument has also been used to explain why computerisation in the 1980s did not initially appear to have any effect on the declining US productivity growth at the time. Similarly, it is possible that the large-scale investment in ICT at the end of the 1990s has only now begun to have a more marked impact. Another important factor in this process is the increasingly strong interaction between ICT, trade and product markets, which enables

Figure B12. ICT investment as a percentage of total investment in selected OECD countries. Per cent

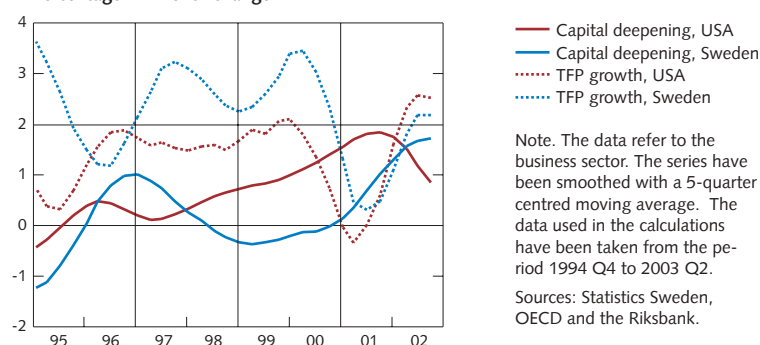


Note. The data refer to investment excluding housing.  
Source: OECD.

streamlining and the outsourcing of labour-intensive stages of goods and services production to emerging markets.

There are differences in this process between Sweden and the United States: capital intensity did not rise as much in Sweden as in the United States during 1995-2000 and did not decline as quickly as in the United States during the slowdown 2001-2002. Nor has investment been composed of as large a percentage of IT hardware in Sweden as in the United States. But like the United States, Sweden has noted a gradual increase in TFP, which distinguishes both these countries from many European economies.

Figure B13. Capital deepening and growth in total factor productivity in the United States and Sweden. Percentage 12-month change



Note. The data refer to the business sector. The series have been smoothed with a 5-quarter centred moving average. The data used in the calculations have been taken from the period 1994 Q4 to 2003 Q2.

Sources: Statistics Sweden, OECD and the Riksbank.

21 One common way to measure TFP is to use a production function with hours and capital stock as inputs and then residually calculate TFP. This measure is intended to capture all rises in production that cannot be explained by labour and capital, i.e. new technology, organisational improvements, etc. In practice, however, this measure is not perfect. For example, the rate of utilisation of the factors of production, which has a clear cyclical effect, will be included in the TFP measure. Measurement errors can also affect TFP. In addition, the calculations are based on assumptions of perfect competition and constant returns to scale, which entails further complications. For calculations using Swedish data that takes account of this see, for example, Carlsson, M., "Measures of Technology and the Short-Run Responses to Technology Shocks", *Scandinavian Journal of Economics* 105, 2003, pp. 555-579.

22 See, for example, Brynjolfsson, E. and Hitt, L., "Computing productivity: firm-level evidence", *The Review of Economics and Statistics* 85, 2003, pp. 793-808, Basu, S., et al "The Case of the Missing Productivity Growth, or...", to be published in *NBER Macroeconomics Annual* 2003, MIT Press, and Gordon, R., "Exploding Productivity Growth: Context, Causes, and Implications", *Brookings Papers on Economic Activity* 2:2003, pp. 1-73.

23 See David, P., "The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox", *American Economic Review Papers and Proceedings* 80, 1990, pp. 355-361 and Schöen, L., *En modern svensk ekonomisk historia, (A modern history of the Swedish economy)* SNS förlag, 2000.

This could be due to the fact that ICT capital has resulted in more efficient workplaces in Sweden as well and gradually made it easier to replace labour with ICT capital – also in Sweden in combination with greater integration with subcontractors in emerging markets.

One fact that supports the hypothesis of a delayed impact of the ICT investment in the 1990s is that the private services sector, which has invested in ICT to an increasing extent, has had markedly higher productivity growth in the United States compared with many European countries. Here, productivity may have benefited from the automatisisation and outsourcing of services through the use of computers and telecommunications. In Sweden, the sharp rise in employment in the services sector (at the expense of manufacturing) has contributed to relatively weak capital deepening in this sector, although the component of capital that has increased fastest has been ICT capital.<sup>24</sup> The rise in productivity has been especially significant in telecommunications firms and staffing companies. In addition, the rise has been particularly fast since 2000, approximately in line with the goods sector where productivity growth is normally more robust. This is in spite of possible errors when measuring the increase in value for the financial sector and for computer consultants, where low or negative productivity growth has been recorded.

To sum up, certain similarities exist between Sweden and the United States. Productivity has risen early in the business cycle, and signs of a stronger average rate of productivity growth sin-

ce the mid-1990s have been confirmed during the economic slowdown. In the 1990s, productivity in ICT production was an important factor but this cannot explain recent developments. However, the impact of ICT investment on workplace organisation may have been more significant. In the background are efficient product markets and increasing openness and integration with the global economy. In the United States, the business cycle has matured more but it is still too early to say whether the recent rise is a sign that the average rate of productivity growth has been raised further compared with the end of the 1990s, even less so whether the same can happen in Sweden, despite parallels with the US economy as regards ICT developments.

During the period 1995-2001, productivity growth in the business sector was 2.7 per cent. At the end of 2001, the Riksbank's forecast for the next two years was 2.2 per cent. However, as mentioned earlier, the number of hours worked was unexpectedly low and the outcome for productivity growth in 2002 and 2003 was instead about 2 percentage points and 1.5 percentage points higher, respectively. Structural changes in the Swedish business sector could entail high average productivity growth in the years ahead as well. Some account of this has now been taken in the assessments for 2004 and 2005. But in the short term, productivity is likely to be affected by cyclical developments and decline somewhat as the recovery progresses. More information about the persistence of the rise in productivity will come as the business cycle matures and employment picks up.

<sup>24</sup> See Lindström, T., "The Role of High-Tech Capital Formation for Swedish Productivity Growth", Working Paper No. 83, National Institute of Economic Research, 2003.



## Recent developments in inflation

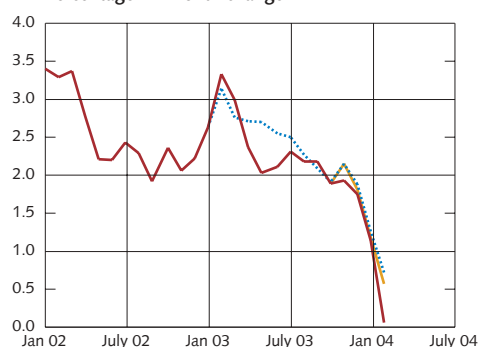
**T**his box describes and analyses developments in inflation since the December Inflation Report. As expected inflation has fallen, due in part to lower energy prices. However, the decline has been somewhat sharper than previously forecast, mainly owing to a low rate of imported inflation (excluding oil prices). In addition, productivity growth has been unexpectedly robust.

### Unexpectedly low inflation

Last year and at the beginning of this year inflation fell sharply. For the most part, this drop was expected following the unusually steep price increases at the beginning of last year (see Figure B14). In the March Inflation Report in 2003, the Riksbank forecast UND1X inflation to be 3.1 per cent in February 2003 and 0.7 per cent in February 2004. The outcomes were 3.3 per cent and 0.1 per cent, respectively. Thus, even though a large decline in inflation was expected, the fall was even sharper than indicated by the Riksbank's forecasts (and those of other forecasters). Figure B14 shows also that the Riksbank as recently as December 2003 overestimated UND1X inflation at the beginning of 2004. UND1X inflation was expected to stand at 0.6 per cent in February but the outcome was 0.1 per cent (the forecast error in January was considerably smaller).

So for a long time the Riksbank has been forecasting a substantial decline in inflation between February 2003 and February 2004, mainly due to an expected adjustment of energy prices to more normal levels. The fact that the fall proved somewhat larger than anticipated is chiefly a result of price developments in the last few months, principally an unexpectedly low rate of imported inflation (excluding oil prices). This in turn appears to be partly because international price pressure has been lower than expected and partly because the impact of the krona appreciation in the past year (particularly against the dollar) appears to have been greater. For example, prices of clothes and footwear in the CPI fell by 4.7 per cent in February compared with the same month last year (see Figure B15). The latter may also be due to overoptimistic plans on the part of the retail trade sector, thus necessitating unexpected price cuts. The recently strong productivity growth has most likely also been a significant factor.

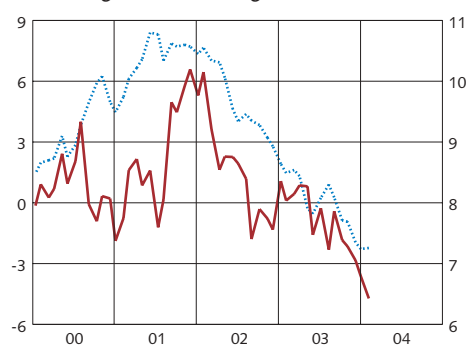
Figure B14. UND1X, outcome and forecasts. Percentage 12-month change



— UND1X  
 ..... Inflation Report 2003:1  
 — Inflation Report 2003:4

Sources: Statistics Sweden and the Riksbank.

Figure B15. Rate of price increases for clothes and footwear in the CPI and the dollar exchange rate. Percentage 12-month change and SEK/USD



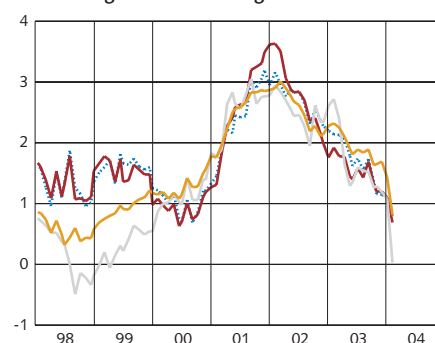
— Clothes and shoes (left scale)  
 ..... SEK/USD (right scale)

Sources: Statistics Sweden and the Riksbank.

### Continued decline in underlying inflation.

In order to analyse how inflation changes in the long term, the Riksbank studies measures of underlying inflation. However, this is not an unambiguously defined measure but can be calculated in different ways. Figure B16 depicts different measures of underlying inflation. The outcome for all measures shows that inflation adjusted for various shocks has more than halved in the last two years.

Figure B16. Different measures of underlying inflation. Percentage 12-month change

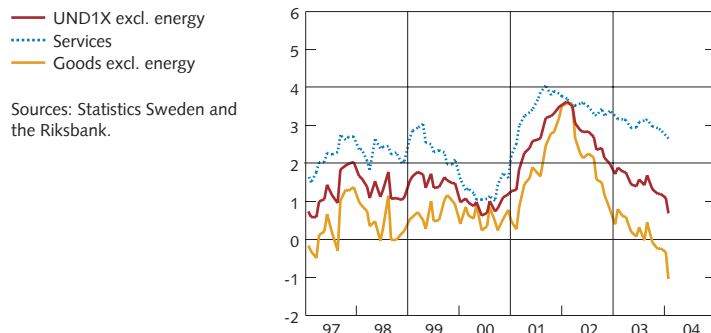


— UND1X excl. energy  
 ..... UND1X excl. energy and food  
 — UND24  
 — trim85

Note. The alternative measures are calculated on the basis of CPI divided into approximately 70 different subgroups. UND24 is weighted together with weights adjusted for historical standard deviations between the annual rate of increase in the CPI and the respective subgroup over the past 24 months. In trim85 the 7.5 per cent most positive and negative yearly price changes each month have been excluded. Sources: Statistics Sweden and the Riksbank.



**Figure B17. UND1X excluding energy prices: breakdown of goods and services.**  
Percentage 12-month change



#### *Lower rate of price increases for both goods and services*

Inflation has differed between goods and services (see Figure B17). Goods prices usually rise more sluggishly than services prices since productivity growth is normally faster in the goods sector than in the services sector. Another difference is that the former is more exposed to international competition than the latter. On average, goods prices excluding energy have fallen over the last six months. Producer price inflation has shown a similar change (see Figure B18). One important

reason is probably that the low international inflation for manufactured goods in the past year and the stronger krona have both led to an easing of imported inflationary pressure.

The rate of price increases for services has remained relatively high even if it has also declined over the past year. One reason is that the rate of price increase for more administratively priced services fell back (see Figure B19). However, municipal charges, for example, are still rising faster than prices of other services. One important reason is probably that local governments are compensating themselves for their strained financial situation by raising various charges, such as those on refuse collection.

#### *Higher oil prices but lower electricity prices.*

Compared with the forecast in the December Inflation Report, the annual rate of increase in energy prices overall has fallen largely as expected. Nevertheless, oil prices have averaged around USD 2 per barrel higher than expected. The higher price of oil has been countered by the weaker dollar, which has meant that the prices paid by consumers for petrol and heating oil have been approximately in line with expectations.

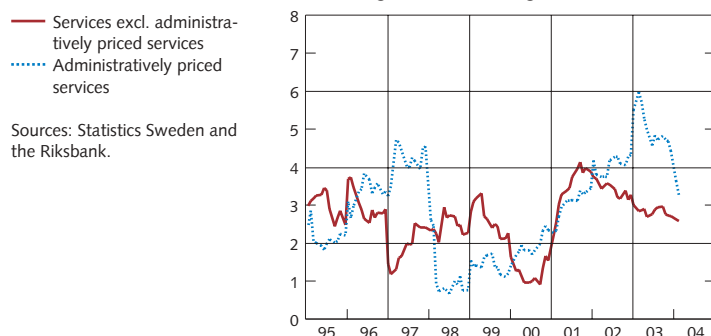
Up to and including February, consumer prices for electricity have fallen largely as expected. However, prices on the Nordic electricity exchange, Nord Pool, have been lower than was indicated by the forward market at the end of last year. Many factors point to the relatively mild winter as one important reason for the lower electricity prices on Nord Pool. The price decline on the exchange has also resulted in a drop in consumer prices for electricity. Electricity trading companies have begun to cut both until-further-notice prices and prices of fixed-price contracts. Electricity prices fell by an annual rate of 2.5 per cent in February, excluding the effects of changed energy taxes, which was consistent with the assessment in the December Inflation Report.

To sum up, the past year has been characterised by a steep drop in the rate of price increases for most goods and services in the CPI, as indicated by the different measures of underlying inflation. The fall in the inflation rate has been sharper than expected, especially in the past few months.

**Figure B18. Manufactured products in the producer channel: domestic market prices and import prices.**  
Percentage 12-month change



**Figure B19. Services prices.**  
Percentage 12-month change



## ■ Inflation assessment

*The general assessment of inflation prospects up to the end of March 2006 is presented in this chapter, given the technical assumption that the repo rate is held unchanged at 2.5 per cent. The chapter begins with a description of what we assess to be the most likely path for inflation over the coming two years. This is then followed by a discussion of the uncertainty and risks surrounding this assessment.*

### Inflation prospects in the main scenario

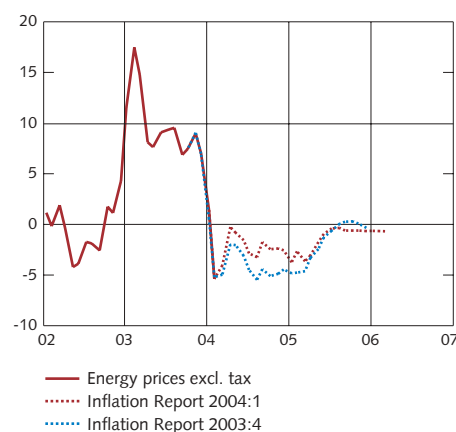
#### ■ Higher oil prices but lower electricity prices.

Both CPI and UND1X inflation during the first months of this year have been considerably weaker than forecast in the December Inflation Report. Inflation excluding energy prices has fallen more than expected, while energy prices have declined largely as anticipated (see also the box "Recent developments in inflation").

The price of oil has not dropped as expected but has continued to be high. It is expected to remain elevated over the coming year. Thereafter, increasing supply is judged to bring the price down slowly to around USD 25 per barrel towards the end of the forecast period. The price of oil is anticipated to be higher throughout the forecast period compared with the assessment in the December Inflation Report. In recent months, spot prices on the Nordic electricity exchange, Nord Pool, have fallen more than indicated by forward prices at the end of last year. Moreover, prices of forward contracts for delivery of electricity during the rest of the year have declined since the December Inflation Report. Consequently, electricity trading companies have begun to lower consumer prices for both until-further-notice contracts and fixed-price contracts. Therefore, the Riksbank has revised down somewhat its forecast of electricity prices for consumers in the short term. These are expected to fall during the spring and summer as reservoir levels are replenished. However, electricity prices for consumers are not anticipated to drop to the levels seen before their steep rise at the beginning of 2003. Instead, they are expected to increase slowly over the coming two years.

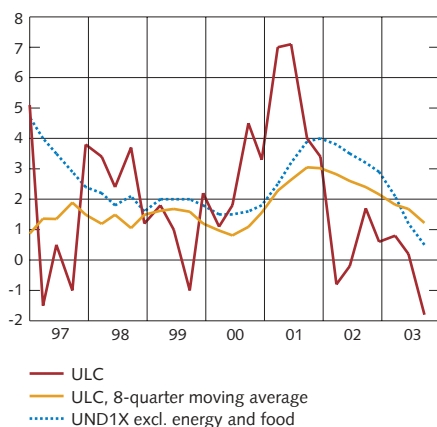
In all, the forecast for energy prices during the latter half of the forecast period is largely unchanged compared with December (see Figure 49). The temporary fluctuations in energy prices that have had a strong impact on inflation since the end of 2002 are judged to have subsided by the middle of 2005. However, it is expected that energy prices will continue to dampen inflation during the rest of 2005 and the beginning of 2006. This is because oil prices are expected to decline somewhat, while electricity prices are anticipated to rise slower than other prices.

Figure 49. Energy prices excluding tax.  
Percentage 12-month change



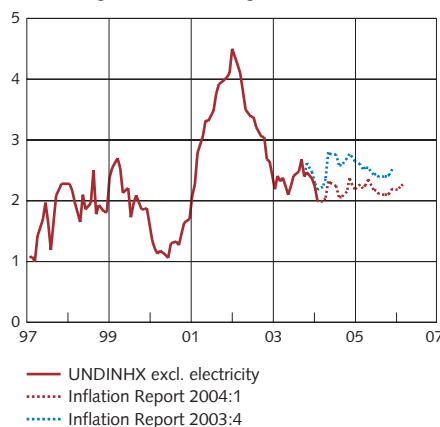
Note. Broken line represents the Riksbank's forecast.  
Sources: Statistics Sweden and the Riksbank.

**Figure 50. UND1X excluding energy and food and unit labour costs in the business sector. Percentage 12-month change**



Sources: Statistics Sweden and the Riksbank.

**Figure 51. Domestic inflation excluding electricity and taxes: outcome and forecasts. Percentage 12-month change**



Note. Broken line represents the Riksbank's forecast.

Sources: Statistics Sweden and the Riksbank.

## ■ ■ Low but somewhat increasing domestic price pressure.

A large number of the rent negotiations for 2004 have now been completed. So far, rent increases have averaged around 2.6 per cent. This is in line with the Riksbank's expectations in the December Inflation Report. Rents are anticipated to rise by an annual average of approximately 2.5 per cent over the forecast period.

Compared with the forecasts in the December Inflation Report, the labour market has been unexpectedly lacklustre and is assumed to be somewhat weaker during the remainder of the forecast period as well. At the same time, production in the business sector is judged to be higher. As a result, productivity growth is expected to be more robust. The weaker labour market also means that the rate of wage increases in the business sector in 2004 has been revised down somewhat. In all, this implies lower unit labour costs compared with the assessment in the December Report. This applies for the greater part of the forecast period.

In addition, due to an unusually large number of working days in 2004 and 2005, the actual rate of increase in unit labour costs will be very low (see also page 34). Thus, domestic cost pressure will be muted in 2004 in particular (see Table 11). It is difficult to know exactly what impact calendar effects will have on inflation. In the long run, it is always firms' actual costs that are the significant factor for prices. However, studies show that prices are sticky and that firms do not usually allow temporary changes in costs to pass through directly to prices. This is illustrated in Figure 50, which shows that domestic prices display greater covariation with a smoothed measure of unit labour costs than with actual costs. Thus, the Riksbank's assessment is that the low cost pressure in 2004 will not achieve its full impact on prices this year but will instead affect inflation gradually. Domestic inflation is therefore judged to be relatively stable over the forecast period and to rise only weakly, despite a considerably faster increase in domestic cost pressure as indicated in ULC. On the whole, labour market conditions, the somewhat changed productivity outlook and recent inflation data point to slightly lower domestic inflation over the entire forecast period (see Figure 51). Domestic inflation in 2004 and 2005 is forecast to average 1.7 per cent and 1.9 per cent annually.

## ■ ■ Rising imported inflation as well.

Apart from the prices of oil products, the rate of increase in consumer import prices has been unexpectedly low over the past year. Import prices for producers have also fallen unexpectedly sharply. One possible explanation is that international price pressure has been lower than foreseen by the Riksbank. Moreover, the stronger krona may have had a larger impact on import prices than expected. An additional factor that may have contributed is the strong productivity growth in Sweden. This is because import prices for consumer goods also contain a large domestic cost component. In the short term, imported inflation is expected to remain subdued. The latest quarterly business tendency survey of the National Institute of Economic

Research (NIER) also shows that firms expect low price increases over the coming quarter (see Figure 52). During the forecast period, international price pressure for manufactured goods is expected to increase while the krona's rate of appreciation is anticipated to decelerate. Thus, imported inflation is expected to stop falling and instead begin to rise gently (see Table 14). One offsetting factor is that the price of oil is anticipated to decline over the entire forecast period.

Compared with the forecast in the December Inflation Report, the forecast for import prices has been revised down, due to the fact that both international and domestic cost pressure is anticipated to be lower. The average price change for imported goods and services in the CPI is forecast to be -1.6 per cent this year and 0.0 per cent in 2005. The corresponding figures in the December Inflation Report were -1.1 per cent and 0.3 per cent.

### ■ ■ CPI inflation higher than UND1X inflation.

Higher energy taxes as part of the green tax shift are expected to add around 0.2 percentage points to CPI inflation annually over the forecast period. In the short term, however, CPI inflation is expected to be lower than UND1X inflation due to lower interest expenditure for households (see Figure 54 and Table 13). A general cyclically-related rise in interest rates is expected to result in higher mortgage rates towards the end of the forecast period. Consequently, households' interest expenditure will increase again and thus contribute to CPI inflation outpacing UND1X inflation.

**Table 13. Change in CPI compared with UND1X.**  
Percentage 12-month change and percentage points

	Mar 04	Mar 05	Mar 06
UND1X	0.1	0.9	1.6
+ Effects of changes in mortgage interest expenditure	-0.6	0.0	0.2
+ Direct effects of changes in indirect taxes and subsidies	0.1	0.2	0.2
=CPI	-0.3	1.2	1.9

Source: The Riksbank.

### ■ ■ Inflation forecast revised down.

The assessment therefore is that CPI and UND1X inflation will accelerate once energy prices cease falling. Thereafter inflation will accelerate further, mainly due to mounting international inflationary pressure. Compared with the December Inflation Report, the forecast for inflation has been revised down as a result of lower electricity prices and lower international and domestic cost pressure. This is countered only partly by higher oil prices.

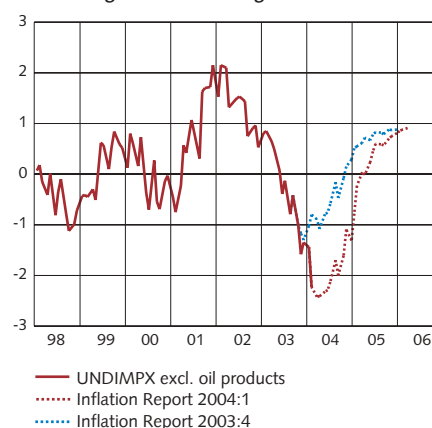
In all, CPI inflation in the main scenario is foreseen at 1.2 per cent one year ahead and 1.9 per cent two years ahead (see Table 14). The corresponding figures for UND1X inflation are 0.9 per cent and 1.6 per cent, respectively.

**Figure 52. Retail sales of textiles, clothes and footwear. Expected sales prices in the next quarter. Net figures**



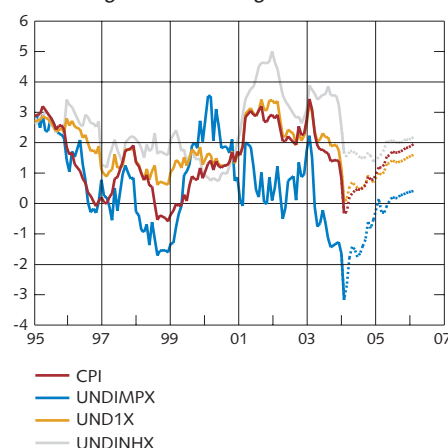
Sources: The National Institute of Economic Research and the Riksbank.

**Figure 53. UNDIMPX excluding oil products: outcome and forecasts in the main scenario. Percentage 12-month change**



Note. Broken line represents the Riksbank's forecast.  
Sources: Statistics Sweden and the Riksbank.

**Figure 54. Different measures of inflation: outcomes and forecasts in the main scenario. Percentage 12-month change**



Note. Broken line represents the Riksbank's forecast.  
Sources: Statistics Sweden and the Riksbank.

**Revised forecasts since the December Inflation Report.**

- Electricity prices in the short term are expected to fall faster than forecast in December.
- Domestic inflation is anticipated to be lower during the forecast period mainly due to lower expected unit labour costs.
- The price of oil is expected to be higher throughout the forecast period.
- Imported inflation is expected to be lower during the forecast period owing to lower international price pressure and lower domestic unit labour costs.
- CPI and UND1X inflation is forecast to be lower throughout the forecast period.

**Table 14. Inflation forecast in the main scenario.  
Percentage 12-month change**

	12-month average			12-month figures		
	2003	2004	2005	Mar 04	Mar 05	Mar 06
CPI	2.1 (2.1)	0.4 (1.1)	1.5 (1.9)	-0.3 (0.4)	1.2 (1.6)	1.9
UND1X	2.3 (2.3)	0.6 (1.1)	1.2 (1.6)	0.1 (0.6)	0.9 (1.3)	1.6
UNDINHX	3.6 (3.6)	1.7 (2.2)	1.9 (2.3)	1.5 (1.9)	1.6 (2.0)	2.2
UNDIMPX	-0.2 (-0.1)	-1.6 (-1.1)	0.0 (0.3)	-2.7 (-2.1)	-0.3 (0.0)	0.4
UND1X excluding energy	1.5 (1.6)	0.9 (1.6)	1.5 (1.9)	0.6 (1.3)	1.5 (1.9)	1.9

Note. The figures in parentheses are the forecasts in the December Inflation Report. UND1X is CPI inflation excluding household mortgage interest expenditure and the effects of changes in indirect taxes and subsidies. UNDINHX refers only to prices of mainly domestically-produced goods and services in UND1X. UNDIMPX refers to prices of mainly imported goods and services in UND1X.

Sources: Statistics Sweden and the Riksbank.

## The risk spectrum

The forecast of inflation that has been presented so far in this Report represents the main scenario. It describes what the Riksbank assesses to be the most likely path for Swedish inflation provided that the repo rate remains unchanged at the current level. There is uncertainty surrounding the forecast, and other possible inflationary paths are also taken into account in the conduct of monetary policy.

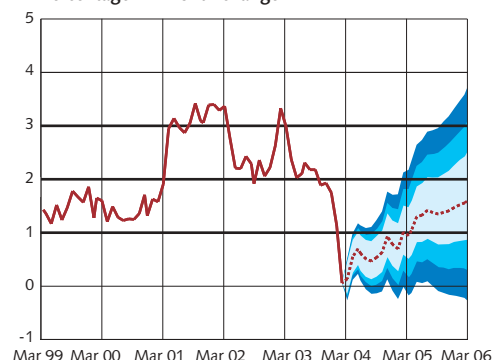
The main risk factors are largely the same as those described in the December Report: the general economic situation both in Sweden and abroad, wage developments and weak domestic inflationary pressure. However, the assessment of the nature of these factors and their importance has altered somewhat. The Riksbank judges the risks of poorer international and domestic economic activity to have diminished and the probability of better activity to have increased. The picture of an economic upswing has become clearer, and at present the greatest risk appears to be in underestimating the strength of the upswing and the consequences for inflation. This is countered somewhat by the risk of underestimating the structural changes - both in Sweden and abroad - that may have given rise to the low cost pressure that has contributed to the recent decline in inflation. The main scenario entails lower forecast inflation than in the December Inflation Report, both in Sweden and abroad. The risk-adjusted inflation forecast is somewhat higher than in the main scenario, because the risk of higher inflation stemming from international and domestic economic developments is not fully balanced by other risk factors. This is illustrated in Figures 55 and 56.

### ■ Risk of higher inflation from economic developments.

In the December Inflation Report, the risks from world economic activity were considered to be balanced. In this Report, the risk of higher inflation is judged to outweigh the risk of lower inflation.

The forecast for growth in the euro area has been revised down somewhat compared with the main scenario in the December Report. At the same time, the forecasts for growth in the United States and other areas of the world have been revised up. In all, this implies a largely unchanged forecast for world market growth compared with the previous assessment. Given that the picture of an international economic upswing has been confirmed, the likelihood has increased that activity will be in line with the main scenario. There is still the possibility that the global recovery could be even stronger than expected in the event of a synchronised rise in growth in the United States, Asia and in eastern and central Europe. International propagation mechanisms could lead to even higher growth, which if so should also have a positive impact on euro area exports and growth. This could also entail higher prices of oil and other commodities than assumed in the main scenario.

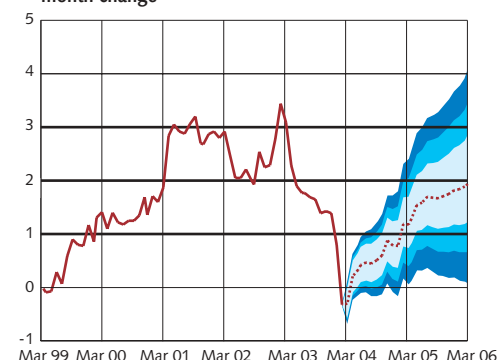
Figure 55. UND1X with uncertainty interval. Percentage 12-month change



Note. The uncertainty interval shows the 50, 75 and 90 per cent probabilities of UND1X inflation being within the respective range. The broken line represents the forecast in the main scenario. The horizontal lines at 1, 2 and 3 per cent are the Riksbank's target and the tolerance limits for the annual change in CPI.

Sources: Statistics Sweden and the Riksbank.

Figure 56. CPI with uncertainty interval. Percentage 12-month change



Note. The uncertainty interval shows the 50, 75 and 90 per cent probabilities of CPI inflation being within the respective range. The broken line represents the forecast in the main scenario. The horizontal lines at 1, 2 and 3 per cent are the Riksbank's target and the tolerance limits for the annual change in CPI.

Sources: Statistics Sweden and the Riksbank.



On the other hand, there are also factors that could result in weaker international activity, mainly in the euro area, but also in the United States. The deficits in the US current account and federal budget are two risk factors that have been difficult to assess for some time. Uncertainty remains regarding what measures may be taken to correct the twin deficits. Fiscal policy is still a risk factor in the euro area as well. This is due to the necessary fiscal restraint facing Germany and France in the years ahead, which could subdue the propensity of households and firms to consume and invest. In addition, concerns over the security policy situation have once again been reflected in the financial markets recently. However, it is still too early to say whether the terrorist attack in Madrid risks hampering the economic recovery in the euro area.

There are also other factors which could give rise to weaker demand both in Sweden and abroad than in the main scenario. For example, in the event of negative developments in employment and unemployment, private consumption could prove weaker than the assessment in the main scenario.

The Riksbank's assessment is that the risks of international economic activity being poorer than anticipated have diminished and that the probability of better activity has increased. The clear signs of an improvement in world economic activity have not yet been reflected in higher international inflation in general. Commodity prices have risen, but at the same time price inflation for manufactured goods has been very subdued. The latter may be due to higher efficiency owing to increased international trade and stiffer competition, which would be a structural phenomenon that could be expected to result in permanently lower inflation. At the same time, the low international inflation is probably partly a result of the economic situation and the low level of resource utilisation. Were monetary policy to remain unchanged, inflation would sooner or later exceed central banks' inflation targets and such a development cannot be ruled out, in Sweden as well, even during the forecast period.

#### ■ ■ Other risks balance one other.

Developments have shown that the risks associated with the economic situation cannot be easily translated into inflationary risks. One factor that could lead to lower-than-expected inflation, even if production and demand develop as forecast, is productivity growth. Productivity has improved unexpectedly sharply in the recent period, mirroring the unexpectedly weak developments in the number of hours worked (see the box "How persistent is the recent rise in productivity?"). The situation has displayed several common features in different countries, e.g. Sweden and the United States, but it is not possible to say with certainty why productivity growth has been so robust, and it is difficult to determine whether it is a transient or more permanent phenomenon. The forecast for Swedish productivity in



the main scenario has been revised up somewhat. This revision could prove too little, however, if the high productivity figures are signs of more lasting improvements in Swedish economic growth. Consequently, there is a risk that inflation could be overestimated. On the other hand, of course, inflation could be underestimated if the rise in productivity should prove only to be temporary.

Electricity prices were a risk factor in the Riksbank's inflation assessments throughout 2003. The risk that electricity prices would not decline as assumed in the main scenario was underlined in risk assessments in several Inflation Reports. The risk of unexpected contagion effects was also emphasised. In the December Inflation Report, rent demands for 2004 were discussed as an example of contagion effects. However, electricity prices have now fallen somewhat faster than expected and the previous price increases do not appear to have spread to other sectors. Thus, electricity prices are currently not one of the most significant risk factors.

In the current year, wage agreements for a large part of the labour market will be settled (see the box "Wage negotiations 2004" in Inflation Report 2003:4). The three-year agreements that have been signed for employees in industry and the retail trade sector (at levels that are in line with the Riksbank's forecasts) have reduced the uncertainty over wage developments. However, there is still a risk that wage formation at local level could lead to higher wage increases and inflation than expected. At the same time, the weak labour market lowers the risk that wages will grow faster than in the main scenario.

The Riksbank judges the risks related to domestic cost pressure to be balanced. Together with the risks of higher inflation that stem from current economic uncertainty, this implies that the risk-adjusted inflation forecast is somewhat higher than in the main scenario.

**Table 15. Inflation forecasts adjusted for the risk spectrum.  
Percentage 12-month change**

	12-month average		12-month figures	
	2004	2005	Mar 2005	Mar 2006
CPI	0.4 (1.1)	1.6 (1.9)	1.2 (1.6)	2.0
UND1X	0.6 (1.1)	1.3 (1.6)	1.0 (1.3)	1.7

Note. The table gives the mean values of the probability distributions for the inflation forecasts in Figures 55 and 56. The figures in parentheses are the corresponding figures in the December Inflation Report.

Source: The Riksbank.

**Table 16. UND1X inflation (12-month rates).  
Percentage probability of different outcomes**

	UND1X<1	1< UND1X<2	2< UND1X<3	UND1X>3	Total
Mar 2005	51 (31)	41 (51)	8 (17)	0 (1)	100
Mar 2006	29 (27)	32 (31)	25 (27)	14 (15)	100

Note. The figures show the probability of UND1X inflation being in the column's interval. The figures in parentheses show the corresponding forecasts in the December Inflation Report.

Source: The Riksbank.

**Table 17. CPI inflation (12-month rate).  
Percentage probability of different outcomes**

	CPI<1	1< CPI<2	2< CPI<3	CPI>3	Total
Mar 2005	38 (24)	48 (52)	13 (22)	1 (2)	100
Mar 2006	20 (17)	30(28)	29 (31)	21 (24)	100

Note. The figures show the probability of CPI inflation being in the column's interval. The figures in parentheses show the corresponding forecasts in the December Inflation Report.

Source: The Riksbank.

**T**his boxed article contains a survey of inflation and monetary policy during the period 2001-2003. Its purpose is to provide a basis for the annual assessment of monetary policy made by the Riksdag Committee on Finance. Last year was characterised by a good level of target fulfilment for inflation in average terms, but also by substantial fluctuations due to changes in energy prices. The Riksbank's forecasts for inflation as a whole in 2003, made in 2001 and 2002, show an acceptable precision, although some sub-components of inflation were less well forecast. The simple rule of action – that the repo rate is changed according to expected inflation a couple of years ahead – essentially provides a good description of the policy conducted in 2001-2002.

### Introduction

The objective of the Riksbank's monetary policy is to maintain price stability.<sup>25</sup> The Riksbank has chosen to specify this task stipulated by the Riksdag (the Swedish parliament) as an annual inflation rate of two per cent measured in terms of the consumer price index (CPI), with a tolerated deviation of +/- one percentage point.

The outcome of inflation in 2001 and 2002 has been analysed in the corresponding boxed articles in Inflation Reports 2002:1 and 2003:1 respectively. This account therefore focuses primarily on the outcome of inflation in 2003. As monetary policy's effect on inflation has a time lag, the outcome of inflation in 2003 is largely a result of the monetary policy conducted in 2001 and 2002. The analysis of monetary policy therefore focuses on the assessments and repo rate decisions from these two years.

The appendix can be summarised as follows: Target fulfilment during 2003 was better than the average during the entire period of inflation targeting so far. The average annual CPI inflation rate was 2.1 per cent and the average UND1X rate was 2.3 per cent. The CPI inflation rate's average deviation from target level (in absolute terms) during the 12 calendar months was 0.6 percentage points. The corresponding deviation during the period 1995-2002 was 1.1 percentage points.

This good rate of target fulfilment as an annual average hides large fluctuations in the inflation rate during 2003. Changes in energy prices contributed to a temporary rise in the inflation rate at the beginning of the year. CPI inflation then exceeded the upper tolerance limit. During the remainder of the year, the trend was towards falling prices and inflation was below target level at the end of the year.

The accuracy of the forecasts of price developments as a whole in 2003, which were made in 2001 and 2002, appears to be good. However, this conceals large and partly counteracting forecasting errors for the two sub-components domestic inflation and imported inflation. Domestic inflation was underestimated, while imported inflation was overestimated.

During the period 2001-2002, the Riksbank essentially followed its simple rule of action with regard to raising the repo rate if the forecast for inflation two years ahead is above the target level, and vice versa. In this sense, the interest rate decisions were motivated.

Expectations of inflation during 2003 among the social partners and participants in the financial markets were stable during 2001 and

**Table B3. Comparison between different measures of inflation, 2003 and 1995-2002. 12-month figures, annual percentage change**

	Annual change		Standard deviation	
	2003	1995-2002	2003	1995-2002
KPI	2.1	1.4	0.7	1.1
UND1X	2.3	1.9	0.5	0.8
UNDIMPX	-0.2	0.9	1.3	1.3
UNDINHX	3.6	2.4	0.2	1.0

Source: Statistics Sweden.

<sup>25</sup> Sveriges Riksbank Act, 1988:1385, Chapter 1, Article 2.

2002. At their highest level, they were 0.7 percentage points above the 2 per cent target. The social partners had higher inflation expectations in general than the financial markets.

### Inflation outcome and deviation from target 2003

#### *Inflation outcome 2003*

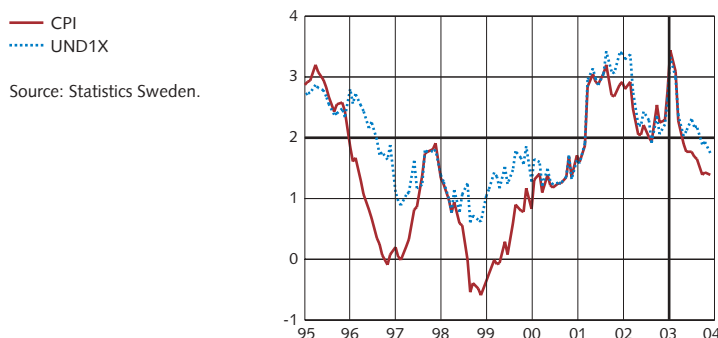
Measured as an annual average, the inflation rate was very close to the 2 per cent target in 2003. CPI increased by 2.0 per cent, while underlying inflation measured as UND1X (which excludes the direct effects of changes in taxes and interest rates) amounted to 2.3 per cent

However, relatively large fluctuations in the individual outcomes for the 12 calendar months lie behind the annual average. At the beginning of 2003, inflation rose substantially and in January and February exceeded the upper tolerance limit of 3 per cent in terms of both CPI and UND1X inflation (see Figure B20). However, by May inflation was back down to the 2 per cent level. This falling trend continued during the remainder of the year, albeit at a slightly slower rate. In December, CPI inflation was 1.4 per cent. UND1X rose slightly during the summer months, but continued falling during the autumn and amounted to 1.7 per cent in December.

The upturn at the beginning of 2003 was primarily driven by rapidly rising energy prices. These prices, which comprise 8 per cent of the CPI basket, rose by 27 per cent in February and March compared with the same months in 2002. After that, the rate of increase declined gradually, but remained at over 15 per cent throughout the year. The high energy prices had an impact on several sub-components of the CPI. For instance, housing costs, which are weighted at almost 30 per cent in the CPI basket, rose by around 6 per cent in the spring, compared with the previous year. Transport prices, which comprise 13 per cent of the CPI basket, rose by between 4 and 6 per cent during the first quarter, partly as a result of higher freight charges linked to the rising energy prices. However, the inflationary trends from the energy price rises were counteracted by the weak development in import prices, partly due to an increasingly strong krona. The krona appreciated by 9 per cent in terms of the TCW index between January 2002 and December 2003 (see Figure B21).

When adjusted for energy prices, inflation in 2003 was much more stable (a discussion of temporary effects follows below). Inflation measured as UND1X excluding energy prices amounted during the first three quarters of the year to between 1.4 and 1.9 per cent. After that, the rate of increase declined to 1.2-1.3 per cent during Q4.

Figure B20. CPI and UND1X inflation 1995-2003. Percentage 12-month change.



(see Table B3). Both of these inflation measures exceeded the average for the period 1995-2002. Domestic inflation (UNDINHX) was high, at 3.6 per cent, but this was compensated by a decline in the price of Swedish imports.

Figure B21. TCW index exchange rate (monthly data).

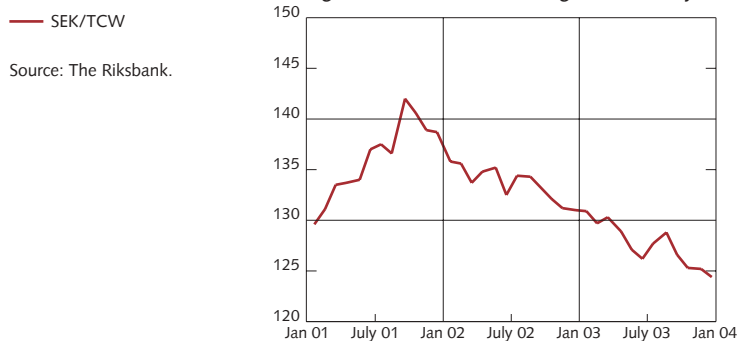


Table B4. Inflation in Sweden and abroad, 2003 and 1995-2002.

	Annual change		Average deviation of 12-month figures from target	
	2003	1995-2002	2003	1995-2002
Australia	2.8	2.7	0.3	1.5
Euro area	2.1	1.9	0.1	0.5
Canada	2.8	2.0	0.9	0.7
Norway	2.7	2.3	1.1	1.0
New Zealand	1.8	2.0	0.5	1.0
United Kingdom	2.8	2.5	0.3	0.3
Sweden	2.1	1.4	0.6	1.1

Note. The following actual or assumed inflation targets have been used in the calculations: Australia 2.5 per cent, EMU 2 per cent, Canada 2 per cent, Norway 2.5 per cent, New Zealand 2 per cent, United Kingdom 2.5 per cent and Sweden 2 per cent. In Australia and New Zealand the target is specified as an interval for inflation (2-3 per cent and 1-3 per cent respectively). It has been assumed in the table that the target is the central point of the intervals. In addition, these two countries only report inflation on a quarterly basis. Interpolating quarterly data to create monthly data changes the result for Australia in 2003 to 0.4. The calculations for Norway refer to the period since March 2001, when inflation targeting was introduced.

Source: The OECD.

If a comparison of the outcome in 2003 and an average for the period 1995-2002 is made, it can be observed that the variability in inflation measured as the standard deviation for the 12-month figures was relatively low last year, despite the apparently rather dramatic developments in inflation (see Table B3). Domestic prices in particular were much more stable than in the comparison period.

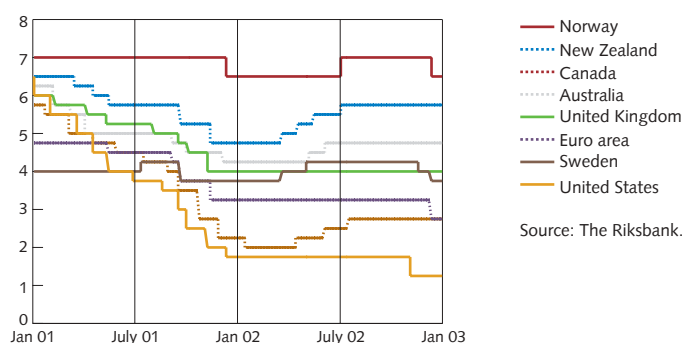
#### *Inflation rate deviations from target level*

As observed above, inflation remained very close to the target level when viewed as an annual average. Despite the fact that inflation fluctuated somewhat and during a brief period it actually exceeded the upper tolerance limit, the deviations from the inflation target were minor from an historical perspective. The average deviation (in absolute terms) for the 12 calendar months was significantly lower than the average monthly deviation for the period 1995-2002.<sup>26</sup>

The average deviation last year amounted to 0.6 for CPI inflation and 0.4 for UND1X inflation, which can be compared with 1.1 and 0.7 respectively for the period 1995-2002.

A comparison of target fulfilment in Sweden with other countries that use inflation targeting shows that the Swedish inflation rate, measured as an annual average, was closest to the target level out of a total of seven inflation-targeting regimes. However, the average absolute deviation

Figure B22. Steering interest rates in Sweden and abroad 2001-2002. Per cent



Source: The Riksbank.

tion during the 12 calendar months was less in the euro area, the United Kingdom, Australia and New Zealand, while it was significantly higher in Canada and Norway (see Table B4).<sup>27</sup>

#### **The Executive Board's monetary policy discussions 2001-2002**

At the beginning of 2001 the repo rate was 4 per cent. It was raised in the summer by 0.25 percentage points, and then cut by 0.50 percentage points two months later in connection with the terrorist acts in the United States. In spring 2002 the repo rate was raised in two stages, taking it from 3.75 per cent to 4.25 per cent. At the end of the year, it was cut, again in two stages, back to 3.75 per cent (see Figure B22).

The increase in July 2001 was motivated

<sup>26</sup> The average deviation is calculated as an absolute value of the difference between the 12-month calendar result and the inflation target.

<sup>27</sup> With the assumption of an implicit inflation target for the United States corresponding to the average of the most recent 10 years, i.e. 2.5 per cent, the United States also had a lower average deviation than Sweden in 2003; 0.4 percentage points

by the fact that the sharp depreciation in the krona during the early summer, combined with the increasingly high level of domestic resource utilisation, was expected to entail a risk that inflation would exceed the target level one to two years ahead.<sup>28</sup> These aspects outweighed the impression that economic activity, both in Sweden and abroad, had entered a weakening phase. The weaker krona had led to interventions by the Riksbank in the foreign exchange market in June.<sup>29</sup> In addition, inflation had risen sharply earlier in the year and in July 2001 it exceeded the upper tolerance level of the inflation target. Inflation expectations in the household sector and the fixed income market for one year ahead had risen since the June Inflation Report was published. The Executive Board considered it important to send a clear signal that the inflation target was taken very seriously. Figure B22 indicates that economic conditions and monetary policy considerations in Sweden differed from those in many other countries, where monetary policy had in many cases become more expansionary as early as the beginning of 2001. However, the decision to raise the repo rate was not self-evident, which is illustrated by the fact that the Executive Board was not unanimous in its decision. Three members entered reservations against the decision, with reference to the weakening economic activity.

The cut of 0.5 percentage points in September 2001 was made during an extraordinary meeting following the terrorist actions in New York on September 11. The Federal Reserve and the ECB also cut their key rates by 0.5 percentage points, while the Bank of England made a cut of 0.25 percentage points. The Executive Board saw a risk of instability in the financial markets as well as a risk of confidence declining in both the household and corporate sectors, which could intensify and prolong the economic slowdown that had already begun to a greater extent than

anticipated. This indicated that with an unchanged repo rate, the inflation rate could be below the Riksbank's target level in two years' time.<sup>30</sup>

All in all, the monetary policy deliberations during 2001 can be described as balancing on the one hand a weak exchange rate, high inflation and rising inflation expectations, which called for tighter monetary policy, against on the other hand weakening economic activity in Sweden and abroad, which called for more expansionary policy. The events of September 11 made the scale tip over towards more expansionary policy.

In spring 2002, the assessment was that inflation one to two years ahead would exceed the target level and the repo rate was raised in two stages from 3.75 per cent to 4.25 per cent.<sup>31</sup> The background was that signs of a recovery, both in Sweden and internationally, were considered to be more evident. A gradual upturn in underlying domestic inflation, combined with unexpectedly high wage increases in the service industries in particular, indicated that resource utilisation in the Swedish economy had been underestimated. Developments in wages and domestic prices were also considered on a more general level to raise questions with regard to inflation propensity in the Swedish economy. As shown in Figure B22, in spring 2002 key interest rates were raised in several other small and medium-sized countries with monetary policy based on an inflation target, such as New Zealand, Australia and Canada. In the United States and the euro area, as in the United Kingdom, conditions were not perceived as motivating an interest rate increase.

Inflation forecasts were adjusted downwards again in November and December, and the repo rate was cut by the same amount it had been raised in the spring. The expected and partially begun recovery had stopped short, according to the Riksbank's Executive Board, and

28 No Inflation Report was published, and there was therefore no forecast stipulated in figures in connection with this meeting. The forecast for the risk-adjusted UND1X inflation rate two years ahead was 2.1 per cent in Inflation Report 2001:2 (published in May).

29 For a more detailed discussion of the interventions in summer 2001, see Heikensten, L. and A. Borg, "The Riksbank's foreign exchange interventions – preparations, decision and communication", *Sveriges Riksbank Economic Review*, 2002:1.

30 This meeting was also held between two Inflation Reports. The most recently published inflation forecast was in Inflation Report 2001:2 (May), which amounted to 2.1 per cent two years ahead, in terms of risk-adjusted UND1X.

31 The forecast in Inflation Report 2002:1 for risk-adjusted UND1X inflation was 2.3 per cent for two years ahead.

manufacturing activity remained weak in both the United States and Europe. There was also concern that the prolonged and severe international stock market fall begun in early 2000 had affected households and firms more than expected. Figure B22 shows that corresponding reappraisals of economic activity and inflation were made by, for instance, the ECB and the Federal Reserve.

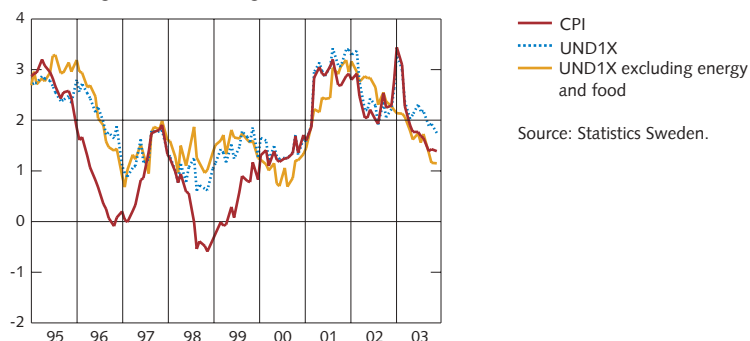
Monetary policy in 2002 can be briefly summarised as follows. Economic policy relief following the terrorist actions in the United States in September 2001 contributed to a modest recovery in international and domestic economic activity. This led to upward adjustments in forecasts for inflation, which led to interest rate increases. During the second half of the year, it became increasingly clear that the recovery had ground to a halt and growth was subdued.<sup>32</sup>

#### *Temporary effects on inflation*

One of the specific issues that came into focus during the period 2001-2003 was how monetary policy should react when substantial price fluctuations in certain individual product groups make a clear impact on general price trends. This has occurred on two occasions in particular in recent years. These are the marked increase in inflation from the beginning of 2001 and continuing into 2002 and the more temporary increase at the beginning of 2003 (see Figure B23). On the first occasion, significant price rises on certain foodstuffs and energy contributed to the upturn in inflation, although other factors, such as a relatively high level of resource utilisation, did play a role. Lower energy and food prices were important explanations for the subsequent sharp fall in inflation during spring 2002. The more short-lived upturn in 2003 is largely explained by fluctuations in energy prices.

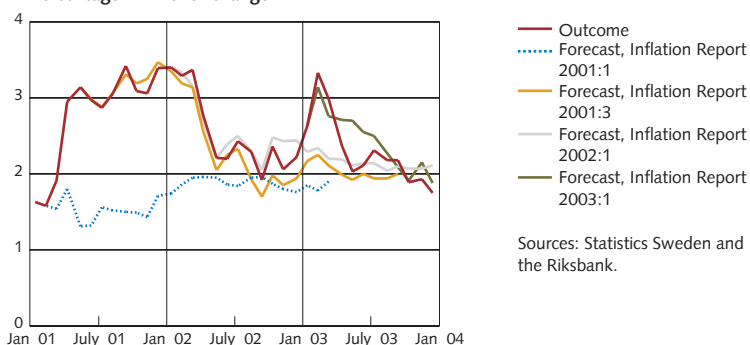
Substantial price changes in individual product groups often come as a surprise and are therefore difficult to forecast. One reason for this is that price fluctuations are usually due to supply shocks resulting from changes in

**Figure B23. CPI, UND1X and UND1X excluding energy and food 1995-2003.**  
Percentage 12-month change



Source: Statistics Sweden.

**Figure B24. Inflation outcome and inflation forecasts for UND1X 2001-2003.**  
Percentage 12-month change



Sources: Statistics Sweden and the Riksbank.

factors that are in their turn difficult or impossible to predict, such as weather conditions or the geopolitical situation. These difficulties can be illustrated with the aid of Figure B24, which shows that the forecasts made in 2001 and 2002 missed the large, temporary rise in inflation in 2003. However, the figure also shows that the two-year forecast made prior to the shocks was relatively accurate.

#### *Lasting or temporary effect on inflation?*

The Riksbank always tries to make an assessment of whether a change in the inflation rate will be lasting or whether it can be expected to be relatively short-lived. As monetary policy has a forward-looking approach, effects on inflation forecasts are of vital importance. If the effects are expected to be lasting, the forecast path of inflation is affected not only during the immediate future, but also in the long term. This

<sup>32</sup> The forecast for Swedish GDP growth in 2003 was revised downwards between Inflation Report 2002:2 (June) and Inflation Report 2002:3 (October), from 2.7 to 2.3 per cent. At the same time, the growth forecast for 2004 was adjusted downwards from 2.5 to 2.1 per cent.



may be the case, for instance, if a large increase in certain prices via cost increases in different channels spreads to more prices in the economy and therefore also makes an impact on inflation expectations. In this case there is reason to apply tighter monetary policy.

If, on the other hand, the effects are expected to be fairly transitory, there will be no effect on the inflation forecasts within the horizon that is normally the focus for monetary policy (one to two years ahead) and there is thus no reason to change the repo rate. However, in certain cases, the forecast in this horizon can be affected at the same time as the effects are expected to abate immediately beyond the forecast horizon. There could then be reason to wait before changing the interest rate. It is worth pointing out in this context that there is no exact defining line between what is temporary and what is lasting. The issue is further complicated by the fact that a change that is largely temporary may also have a more lasting element. For instance, if energy price trends are due not only to weather conditions, but also to fluctuations in demand and long-term changes caused by, e.g. changes in regulations and taxation.

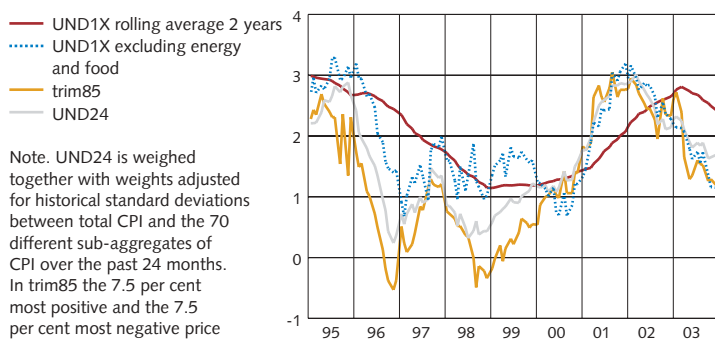
The Riksbank made the assessment that both increases in inflation during the period

2001-2003 had significant temporary elements, which is indicated by the forecasts in Figure B24. This applies in particular to the increase in 2003, but largely also to the earlier increase. With hindsight, these assessments appear to have been correct.

In May 2001, it was observed that the price increase in spring 2001 was mainly concentrated on a number of product groups, where prices had risen for easily identifiable reasons that were unrelated to general demand. Water levels in hydroelectric power companies' reservoirs had been low during the previous winter, while various diseases had afflicted cattle. Energy and food prices later fell back and contributed to the fall in inflation in spring 2002.

It was observed in the March 2003 Inflation Report that the sharp rise in inflation was largely due to higher energy prices resulting from extremely low water levels in power station reservoirs and from higher oil prices. The energy price increase was assessed as essentially entailing only temporary effects on price levels and inflation was expected to fall again during the spring as electricity and oil prices declined (see Figure B24). Energy prices did fall during the ensuing months and inflation fell by almost one percentage point.

**Figure B25. Monthly outcome for UND1X excluding food and energy, UND1X rolling 24-month mean value, UND24 and trim85, 1995-2003. Percentage 12-month change**



Note. UND24 is weighed together with weights adjusted for historical standard deviations between total CPI and the 70 different sub-aggregates of CPI over the past 24 months. In trim85 the 7.5 per cent most positive and the 7.5 per cent most negative price changes each month have been excluded.

Sources: Statistics Sweden and the Riksbank.

#### *The path of inflation adjusted for temporary effects*

Sometimes the Riksbank has chosen to highlight an inflation index that is adjusted for temporary effects, in order to gain a picture of the more underlying, cyclically-related path of inflation. Figure B25 shows some of the measures of underlying inflation usually used by the Riksbank.

As most of the measures of underlying inflation rose at the beginning of 2001, it is clear that the path of inflation then was also determined by more underlying, cyclically-related factors.

The reason the Riksbank has chosen to use UND1X and, in recent years, UND1X excluding energy or UND1X excluding food and energy, is not that these measures are better target variables. The purpose is instead to illustrate that there are relatively few easily identifiable reasons for

the large deviations from target level observed since the inflation target was introduced (lower interest rates at the end of the 1990s and volatile food and energy prices at the beginning of the 2000s).

#### *Forecasts and monetary policy decisions*

The Riksbank usually describes its inflation-targeting policy in terms of a simple rule of action: if the inflation forecast one to two years ahead exceeds two per cent (given an assumption of an unchanged repo rate) the repo rate will usually be raised, and vice versa. Given this, an assessment of monetary policy should contain, in addition to a survey of the degree of target fulfilment, an analysis of the quality of the forecasts and an analysis of to what extent the interest rate decisions made appear to be reasonable, given the forecasts that were made.

Below follow some different approaches for analysing the Riksbank's actions in 2001-2002. The section is divided into two parts. The first provides a survey of the Riksbank's forecasts. The second is aimed at examining how consistent, or understandable, the Riksbank's actions have been. The monetary policy conducted is compared with the interest rate paths given by some simple rules. This section concludes with a brief outline of the development of inflation expectations in 2001 and 2002.

#### *The quality of the forecasts*

The inflation forecasts that guide monetary policy are inherently uncertain. In addition to an assessment of the most probable developments in economic activity and inflation (known as the main scenario), the Riksbank also assesses the uncertainty of the forecasts. This is illustrated in the Inflation Report with an uncertainty interval around the most probable course of developments. Whether the uncertainty is higher or lower than normal and to what extent upside or downside risks dominate can be significant for the interest rate decision.

A reasonable requirement when assessing monetary policy is that the Riksbank's forecasts should not on average be less accurate than those made by other analysts. One problem in this regard is that the Riksbank's forecasts are based on the assumption of an unchanged repo rate during the entire forecast period. It is therefore natural that they differ from other analysts' forecasts, as the latter may be based on assessment that the repo rate will be changed. If the repo rate is changed substantially during the period, a comparison with other forecasters may therefore be misleading. However, it should be pointed out that repo rate changes during this period were relatively limited. A further problem when making comparisons is that different analysts' forecasts are published at different times

**Table B5. The Riksbank's forecasts and outcome in 2003 of some important variables of the inflation forecast.**

12-month average	IR 01:1	IR 01:2	IR 01:3	IR 01:4	IR 02:1	IR 02:2	IR 02:3	IR 02:4	Outcome
GDP growth 2002				1.8	1.6	1.6	1.7	1.5	1.9
TCW	-	123.6	131	127	127.2	128.2	128	128	<b>127.6</b>
Oil price USD	22.2	22.2	22.2	22.2	22.9	23.5	24.9	23.9	<b>28.8</b>
Household consumption	2.1	2.4	2.1	2.1	2.5	2.4	2.0	2.1	<b>2.0</b>
Business sector wages	3.9	3.9	3.7	3.6	4.1	4.1	3.8	3.9	<b>3.3*</b>
Unit labour costs in business sector	2.2	2.0	1.7	1.8	1.9	1.9	1.8	2.8	<b>1.4*</b>
International export prices	1.2	1.2	0.9	0.7	1.5	1.5	1.1	0.9	<b>0.5*</b>
UNDINHX	-	-	-	2.4	2.8	2.8	2.7	2.9	<b>3.6</b>
UNDIMPX	-	-	-	0.9	0.7	0.4	0.2	0.0	<b>-0.2</b>
UND1X	-	-	-	1.9	2.1	2.0	1.9	1.9	<b>2.3</b>
CPI	-	-	-	2.0	2.2	2.2	2.2	2.1	<b>2.1</b>

Note. The forecast for GDP growth refers to growth in 2002, as the level of activity in the economy affects inflationary pressure with some time lag. Household sector consumption, business sector wages, unit labour costs in business sector, international export prices, UNDINHX, UNDIMPX, UND1X and CPI are annual rates of change. International export prices are OECD-weighted.

The outcome for 2003 is not yet available. The figures refer to the forecast for 2003 published in Inflation Report 2003:4.

Sources: Statistics Sweden and the Riksbank.

and therefore not based on the same information. The analysis below therefore has certain deficiencies.

The forecasts in 2001 and 2002 for inflation in 2003 were stable and relatively close to the actual outcome (see Table B5). The rate of increase in CPI was overestimated slightly, while UND1X inflation was underestimated by up to 0.4 percentage points. The forecasts for the exchange rate (in terms of TCW) made in 2002 were also stable and close to the actual result. However, the forecasts for other variables were less accurate. Domestic inflation, for instance, was underestimated by between 0.7 and 1.2 percentage points. GDP growth in 2002 and oil prices in 2003 were also underestimated. At the same time, wage trends were overestimated, as were the increase in unit labour costs in the business sector and international export prices. Imported inflation was also significantly overestimated, despite the relatively accurate exchange rate forecasts.

Compared with other analysts, the Riksbank ranked between the National Institute of Economic Research and an average of other analysts with regard to accuracy of CPI forecasts for 2003. The mean square error in 2001 and 2002 was 0.02 for the National Institute of Economic Research, 0.04 for the Riksbank and 0.06 for the other analysts.<sup>33</sup>

#### *The monetary policy decisions 2001 and 2002*

One means of examining the plausibility of the monetary policy decisions is to try to answer the question of whether the monetary policy decisions were easily understandable given the forecasts the Riksbank made, or to put it another way, whether the Riksbank has acted consistently. This is done below by relating the interest rate decisions to the simple rule of action the Riksbank claims to follow. A comparison is also made with an interest rate setting rule which *ex post* has proved better at describing the Riksbank's actual actions. Where the actual rate has differed substantially from these rules, explanations for this are discussed.

Interest rate decisions can also be assessed according to other criteria. In conclusion, there is an examination of whether monetary policy is perceived as credible in the sense that inflation expectations have remained close to the inflation target. As monetary policy has an impact with some time lag, the assessment focuses mainly, as before, on the interest rate decisions in 2001 and 2002.

The Riksbank usually describes its inflation-targeting policy in terms of a simple rule of action: if the inflation forecast one to two years ahead exceeds two per cent (given an assumption of an unchanged repo rate) the repo rate will usually be raised, and vice versa. It is important to note that this is not an exact rule of action that the bank follows mechanically. One reason for not following the rule mechanically is that supply shocks may have the opposite effect on inflation to the effect on the level of activity in the economy. A large increase in oil prices, for instance, as occurred in the 1970s, can lead to rising inflation but have negative effects on growth. In these cases a rapid return to the inflation target may be connected with substantial macroeconomic costs. Another reason may be that the economy is exposed to inflation impulses that affect inflation forecasts one to two years ahead, but these effects abate soon after the forecast horizon.

The simple rule of action based on inflation forecasts is a simplification of interest rate policy but puts the focus on the Riksbank's objective of an inflation rate of two per cent. The rule is therefore a natural starting point for analysing the Riksbank's interest rate decisions. Given that such a rule normally describes the actual policy relatively well, it can be used to make good forecasts of monetary policy, which in turn reduces the risk of the Riksbank's decisions being perceived as unexpected. The rule can be formalised in the following way:

$$i_t = i_{t-1} + \alpha(\pi_{t+8}^F - 2)$$

where  $i_t$  signifies the repo rate per quarter  $t$ ,  $\pi_{t+8}^F$  the forecast for inflation two years ahead

<sup>33</sup> This ranking is in line with the more extensive comparison of forecasts by 16 analysts during the period 1993-2001 in Blix, M., K. Friberg and F. Åkerland, "An evaluation of forecasts for the Swedish economy", *Sveriges Riksbank Economic Review*, 2002:3.

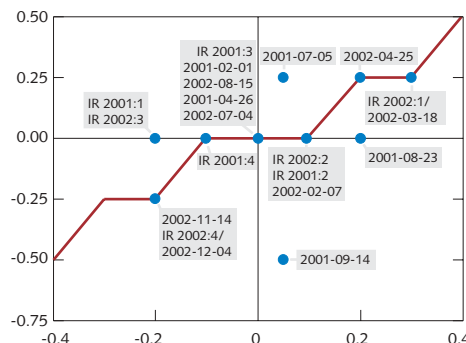
(8 quarters) and  $\alpha$  a positive coefficient. The equation therefore says that if the forecast exceeds the inflation target, that is to say, if the expression in brackets is positive, the repo rate will be set at a higher level than in the previous quarter.

So how well has the Riksbank followed this simple rule of action? Figure B26 shows the relationship between the forecast's deviation from the inflation target two years ahead and the actual repo rate change at the time of the forecast. The inflation measure used in this diagram is UND1X inflation, adjusted for any asymmetry in the risk spectrum. If the Riksbank has followed the rule of action, there should be a fairly clear positive correlation in the figure. However, one circumstance that needs to be taken into account is that the repo rate is now usually adjusted in discreet stages as multiples of 0.25 percentage points, i.e. by 0.25, 0.50 percentage points, etc. This means that minor deviations between forecasts and inflation target will not always lead to any measure being taken by the Riksbank. An action where repo rate changes are only made in this way when the deviation from the forecast is sufficiently large gives rise to a "staircase" pattern. It is assumed here that the simple rule of action implies that the repo rate is changed by 0.25 percentage points if the deviation between forecast and inflation target is at least 0.2 percentage points, with 0.50 percentage points if the forecast deviation is at least 0.4 percentage points, and so on.

Figure B26 shows firstly that the correlation between repo rate changes and forecast deviations in the period 2001-2002 was clearly positive. Secondly, it shows that most of the observations (13 of 18) fit into the "staircase". The only really significant deviation was in September 2001. It therefore appears that the simple rule describes the Riksbank's actions during the period relatively well.

One problem is that only four of the eight monetary policy meeting normally held in a year can be linked to a published inflation forecast. For the remaining four meetings, the inflation forecast in Figure B26 has been approximated

**Figure B26. The Riksbank's inflation forecasts and repo rate changes in 2001 and 2002.**  
Repo rate changes on vertical axis and forecast deviations from risk-adjusted UND1X on horizontal axis.



Note. The forecasts refer to risk-adjusted UND1X two years ahead. The monetary policy meetings in connection with the publication of Inflation Reports are designated IR 2001:1, and so on. Monetary policy meetings not coinciding with the publication of a report are only designated a date. There are no published inflation forecasts for the latter. Here an approximation has been made using the mean value of the immediately preceding and immediately following published forecasts.

Source: The Riksbank.

with the mean value of the published forecasts immediately preceding and immediately following the meetings. One consequence of this procedure is that the constructed inflation forecast and the inflation assessment on which the interest rate decision is based in practice may differ somewhat.

This could partly explain the large deviation from the rule in September 2001 in connection with the terrorist acts in the United States. The interest rate was then cut by 0.5 percentage points despite the (constructed) inflation forecast being almost unchanged. However, it was pointed out in connection with the rate cut that there was a risk that inflation would be below the target level two years ahead if the repo rate was unchanged. The inflation forecasts published prior to and after September 2001 thus appear to have been based on a much brighter view of economic activity than that prevailing at the time. In addition, the inflation forecast that followed was affected by the actual interest rate cut and is therefore higher than it would otherwise have been.

Nevertheless, it is still probable that the data problem is not the entire explanation for the large deviation. There was unusually great uncertainty at that point in time and a marked cut was considered to be an insurance against a much poorer future growth in the real economy as well as against instability in the financial markets.

The simple rule has certain advantages, but gives an overly simplified description of

the Riksbank's actual behaviour. In practice, monetary policy reacts to a number of shocks to the economy, and the effects of these shocks are not merely captured by inflation forecasts for a particular time horizon. An alternative method of analysing the Riksbank's actions is to examine which set of variables best describes

the Riksbank's rate setting after the event. By studying the relationship between the Riksbank's interest rate decisions and the published forecasts for inflation and GDP growth for different horizons, it is possible to estimate an empirically-adjusted monetary policy reaction function. One reaction function that has proved to work well

$$i_t = 0.26 + 0.73i_{t-1} + 0.19(\pi_{t,0}^F - 2) + 0.49(\pi_{t,1}^F - 2) + 0.14y_{t,0}^F + 0.20y_{t,1}^F$$

since 1993 is the following:<sup>34</sup>

According to this rule, interest rate setting takes into account the prevailing interest rates, for inflation forecasts made in quarter  $t$  for the current year ( $t, 0$ ) and next year ( $t, 1$ ) and their deviation from the two per cent target, as well as forecasts for GDP growth in the current year and next year ( $y_{t,0}^F$  and  $y_{t,1}^F$ ).

This estimated rule also provides a good description of the actual repo rate developments during the period 2001-2002. Only at 4 of the

18 monetary policy meetings was the deviation between the actual repo rate and the rate implied by the rule 0.25 percentage points or greater (see Table B6 and Figure B27). As in the case of the simple rule, the only really significant deviation was in September 2001. Data problems could be part of the explanation there, too, as the forecasts associated with monetary policy meetings not coinciding with the publication of an Inflation Report have been constructed in the same manner as above.

**Table B6. Actual repo rate and calculated repo rate according to adapted rule.**

Date of monetary policy meeting	Repo rate calculated at risk-adjusted UND1X according to adapted rule	Repo rate before/after decision
<b>2001</b>		
1 February 2001	4.1	4.0
Inflation Report 2001:1	3.8	4.0
26 April 2001	3.8	4.0
Inflation Report 2001:2	3.8	4.0
5 July 2001	4.0	4.0/4.25
23 August 2001	4.0	4.25
19 September 2001	4.2	4.25/3.75
Inflation Report 2001:3	4.0	3.75
Inflation Report 2001:4	3.7	3.75
<b>2002</b>		
7 February 2002	3.9	3.75
Inflation Report 2002:1	4.1	3.75/4.0
25 April 2002	4.2	4.0/4.25
Inflation Report 2002:2	4.3	4.25
4 July 2002	4.2	4.25
15 August 2002	4.2	4.25
Inflation Report 2002:3	4.1	4.25
20 November 2002	4.1	4.25/4.0
Inflation Report 20 02:4	3.9	4.0/3.75

Note. Inflation forecasts attributed to monetary policy meetings not coinciding with the publication of an Inflation Report have been approximated using the average of the immediately preceding and immediately following forecasts.

Source: The Riksbank.

34 Berg, C., P. Jansson and A. Vredin, "How useful are simple rules for monetary policy? The Swedish experience", unpublished essay, March 2004, Sveriges Riksbank.

### *Inflation expectations for 2003*

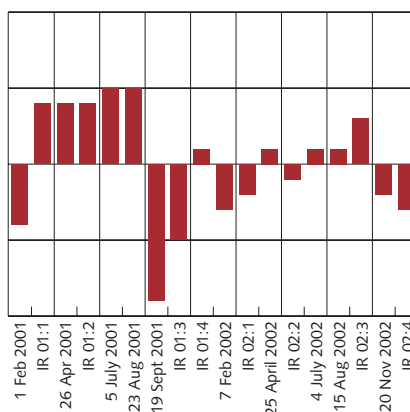
Inflation expectations are important for firms' price-setting behaviour and for wage formation, and thereby also for inflation. If economic agents are confident that inflation really will be kept low, firms will not consider it necessary to change their prices as often when, for instance, they perceive a rise in costs to be temporary. In the same way, stable inflation expectations can result in moderate wage increases, which facilitate the Riksbank's aim of achieving price stability.

Consequently, the fact that inflation expectations are firmly anchored at the Riksbank's target is no reason for the Bank to leave the repo rate unchanged. Rather, this should be taken as a sign that the public expects the Riksbank to do what is necessary to ensure that inflation is 2 per cent. In other words, inflation expectations can be seen as a measure of the public's confidence in the Riksbank to attain the inflation target.

However, if inflation expectations deviate from the target, it suggests that the public does not believe that the Riksbank will manage to keep inflation at the target level. The Riksbank may then need to adjust the repo rate at a different pace than is reflected in expectations of future monetary policy. In this way, different measures of inflation expectations and market expectations of monetary policy serve as a supplement to the Riksbank's inflation forecasts.

During 2001 and 2002 expectations of the inflation rate in 2003 were generally slightly above the target level, but within the tolerance

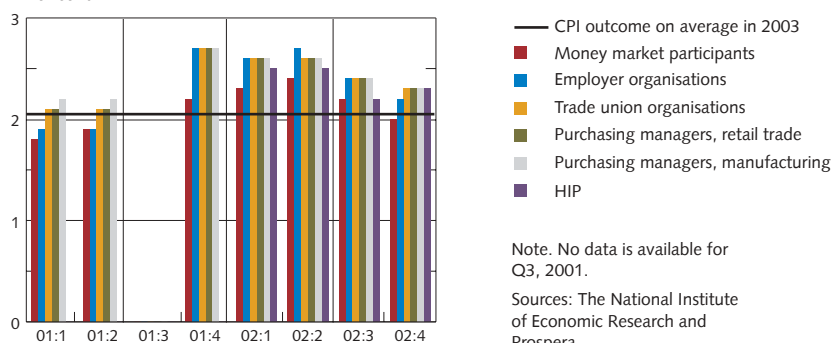
**Figure B27. The difference between the actual repo rate and a repo rate calculated using an adapted rule. Percentage points**



Note. This rule is calculated on average annual forecasts and the figure is based on the results in Table B6.

Source: The Riksbank.

**Figure B28. Inflation expectations for 2003 during 2001 and 2002. Per cent**



Note. No data is available for Q3, 2001.

Sources: The National Institute of Economic Research and Prospera.

interval (see Figure B28). They were at their highest level at the end of 2001 and thereafter declined gradually to a level of around 2.3 per cent. Financial market participants in general had slightly lower inflation expectations than the social partners and business sector purchasing managers. All in all, the Riksbank's actions in 2001 and 2002 appear to have been compatible with retaining confidence in the inflation target.